MAR 24 1924

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Vol. 50
Number 12

PUBLISHED WEEKLY AT 239 WEST 39th STREET
NEW YORK, MARCH 20, 1924

Thirty-five cents a copy
Three dollars a year

ATWATER KENT

Makers of
THE WORLD'S HIGHEST GRADE IGNITION
STARTING AND LIGHTING

A Real Sales Help

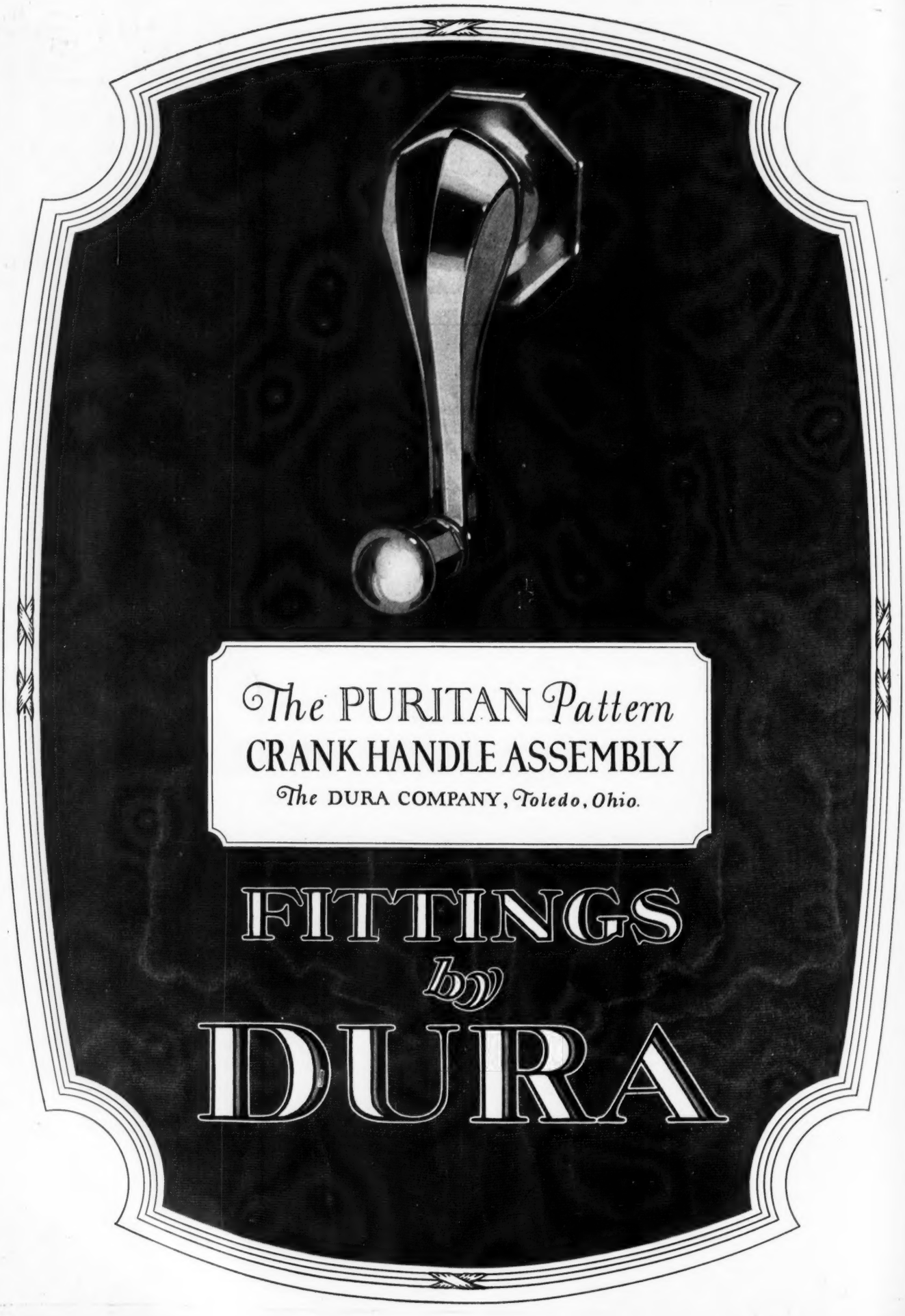
THE prospective buyer, whether experienced or not, knows that ATWATER KENT automotive electrical equipment is a criterion of excellence throughout the world.

Its dependability and performance are famous.

Units of this character as standard equipment are a real help to sales.

ATWATER KENT MANUFACTURING COMPANY, PHILADELPHIA, PA.
4949 STENTON AVENUE

Entered as second-class matter Jan. 2, 1913, at the post office at New York, N. Y., under Act of March 3, 1879.


The PURITAN Pattern
CRANK HANDLE ASSEMBLY
The DURA COMPANY, Toledo, Ohio.
FITTINGS
by
DURA

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. L NEW YORK—THURSDAY, MARCH 20, 1924 No. 12

Production Figures Do Not Show Small Makers Hopeless

Cars in lowest price class accounted for four-fifths of gain in 1923 output. Those selling for $500 or less had 73 per cent increase. Facts significant.

By James Dalton

PROMINENT industrialists, bankers and economists are virtually a unit in declaring that the future trend of the automotive industry will be toward greater concentration in the hands of a few powerful combinations. Superficial examination of the situation might indicate that they are correct in their assumption, but a closer survey of the facts leaves considerable room for argument.

Passenger car production in 1923 showed an increase of 1,300,000 units, or 56 per cent over 1922, but——

Production of cars selling for $500 or less accounted for 1,047,000 of this gain, or 80 per cent. Ford alone accounted for 48 per cent of the entire increase over 1922.

Production of all cars selling for $500 or less showed an increase of 73 per cent.

Production of all cars selling for more than $500 showed an increase of only 27 per cent.

The significance of these facts should not be overlooked in any consideration of the future.

THEY mean, primarily, that the country has gained a somewhat exaggerated notion of the rapidity with which automobile buying is increasing except in the lowest price class. The fact that many of the purchasers in the $500 or under list bought closed cars costing much more than the open models, which are the only ones taken into account in fixing these price classes, has no especial bearing on the situation. It indicates simply that they would prefer to have a sedan or a coupé than a touring car of a more expensive make costing about the same.

The market for cars above $500 comes much nearer retaining the same general proportions than does the market for vehicles under that figure, although it is to be expected there will be gradual annual increase. This is the only field which offers a chance for the small producers, and it is doubtful if they can market their products profitably if they sell for less than $1,000. Their opportunity depends largely upon originality for they will appeal to a class of buyers limited in number.

NO new factors have arisen to make existence more precarious for independents. A large majority of the failures in the past have not been due to a greater concentration of business in the hands of a few companies but rather to overambition and mistaken policies, especially in the sales departments.

Companies making 2000 to 3000 cars a year, or even less, have attempted to compete along parallel lines, on a national basis, with companies having a market for five, ten or twenty times as many cars. It simply can't be done. Concentration of effort in a limited territory and originality of sales methods are just as essential as originality of design.

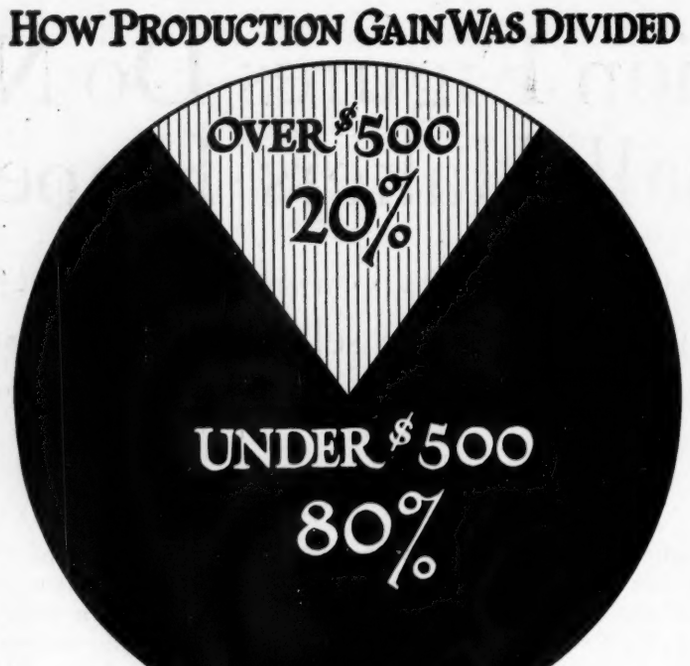
Automobiles can't be sold without an efficient retail sales organization and dealers can't live without factory cooperation and guidance. Many of these companies have insisted upon their big city dealers, with a limited market, maintaining the same ornate and

expensive establishments as their rivals handling lines for which there is a much wider demand. These dealers have been handicapped, also, by totally inadequate factory service and the necessity of giving ruinous trading allowances if they are to make sales.

Competition, quite naturally, is more intense in large cities than in any other communities, and the saturation point is much nearer in urban districts because of traffic congestion, lack of reasonably priced garage facilities and other factors. The best immediate market for higher priced cars is in the smaller towns and cities and the rural sections. Some day a small company will come along which will concentrate its sales efforts on exactly such communities and it will make a success by beginning where the others have left off.

The dealer problem is the most difficult and complex confronting the industry today. Small concerns can't hope to compete with big ones when it comes to building up a nation-wide sales organization. They can compete successfully, however, if they study closely their best possible markets and concentrate their sales efforts in them.

This condition is no different than it ever was. Past failures, in other words, have not been due to concentration and consolidation, but rather to inefficient management. Recent experience has given abundant evidence that new companies, adequately financed, with a good product and with an experienced and intelligent management, can carve out a place for themselves in the face of the keenest kind of competition with old, solidly established manufacturers with a large output.



Production in 1923 exceeded that of 1922 by about 1,300,000. This chart shows that low priced cars were responsible for a large proportion of the gain

Analysis of production in 1923 as compared with 1922 is interesting and it may be valuable in consideration of the future, but it should be kept in mind that the seemingly increased degree of concentration was due largely to a greater demand for the lowest priced products. The potential market in this price class is an interesting subject of speculation. One point worth thinking about is that it probably will contract more rapidly than any other in the event of a general business depression, but such an eventuality seems remote at this time.

Eight Companies Have Heavy Production

Eight companies manufacturing twenty lines of passenger cars had a combined production in 1923 of 3,088,000 or 84.9 per cent of the total of 3,636,000.

This list included Ford with Lincoln; General Motors with Chevrolet, Buick, Oakland, Oldsmobile and Cadillac; Willys-Overland with the Overland and Willys-Knight; Durant with the Star, Durant and Flint; Hudson with the Hudson and Essex; Maxwell and Chalmers; Paige Detroit with the Jewett and the Paige, and the Chandler-Cleveland combination. They constitute the only important companies turning out cars bearing different names.

The four leading "independents" Studebaker, Dodge, Nash and Hupp, had a combined output for the year of 393,000. This includes all the lines with a production of 20,000 or more.

Concentration of Output

Twelve companies, therefore, turning out twenty-four lines, made 3,481,000 automobiles in 1923, or 95.7 per cent of the total. The same companies made 93.6 per cent of the total in 1922, but Durant did not get under way with the Star until late in that year and he made 130,000 of them in 1923.

The list from which this computation has been made included 93 names in 1922 and only 78 last year. No less than thirty-three names listed at the beginning of 1922 have passed out of the picture completely or are on their way out by reason of bankruptcy, receivership, dissolution or consolidation.

Total production of all these companies in 1922, however, was only 22,850, or less than 1 per cent of the total for all companies. Sixteen of these concerns which remained in production on a small scale in 1923 made only 8500 cars or less than one-quarter of 1 per cent of the total production for that year. One company, which has decided to liquidate, made 4000 last year and 3000 the preceding year.

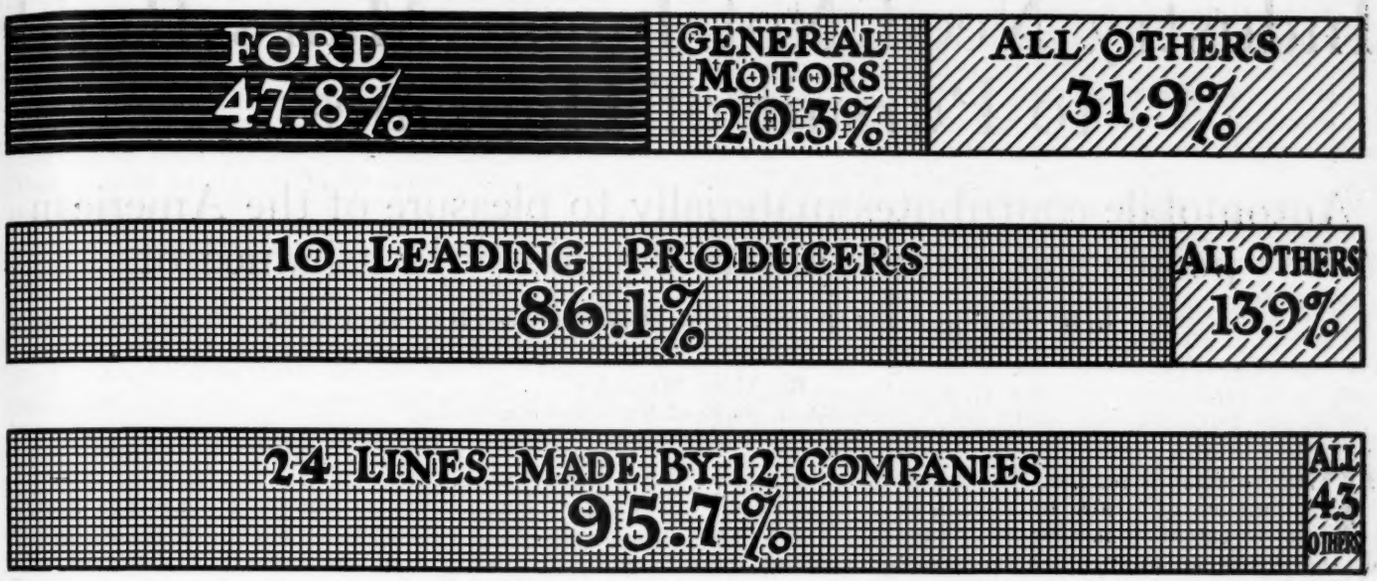
These facts indicate that the motor car business is rapidly becoming concentrated in the hands of a few companies, and so far as volume of production is concerned that is true, always has been true and probably always will be true. It should not be forgotten, however, that in addition to the foregoing list there was one company with an output of 19,000; one with 17,000; one with 16,000; two with 10,000; two with 9000; one with 8000; one with 7000; one with 6000, and two with 5000, making a total of 121,000.

There were five companies with a production of 4000 each and fourteen others with an output ranging from 1000 to 3000. Ten of the remaining 25 on last year's list are concerns either making very expensive cars or doing what amounts to custom work and consequently appealing to what is normally a limited market.

Between fifteen and twenty of the companies on the list are on their way out, but there remain approximately 60 which are perfectly sound. They have a good product and are strong financially. It should not be assumed that because a company has a small production it is essentially weak. A concern which builds 1000 cars a year in the medium price field can make money if it keeps down selling costs by seeking distribution in only a limited territory. A company which makes a car in the highest price class can return a profit on a much smaller output.

Greater concentration of production in the hands of

How 1923 Production Was Divided



the twelve leading companies in 1923 was due almost exclusively to the tremendous demand for cars selling for $500 or less. Output of cars in that price class aggregated 2,478,000 last year, or 68.1 per cent of the total, whereas it was only 1,431,000, or 61.3 per cent of the total in 1922. This was a percentage of gain of 6.8.

Eliminating from the twenty-four leading lines the four within the lowest price group, the combined output of the remainder was 1,228,000 in 1923 or 33.8 per cent of the grand total, while the same companies made 965,000 or 41.3 per cent of the total in 1922, a percentage loss of 7.5.

Small Companies Progress

All the other companies in the field making more than 1000 cars last year had a total of 157,900 or 4.3 per cent of the grand total, while the same companies made 139,900 in 1922, or 5.7 per cent of the grand total, a percentage loss of 1.4. Eliminating from these figures the output of six companies which began slipping in 1922 and slipped still further last year, we find that the percentage loss in this group last year was only 00.7.

These figures seem to offer fairly conclusive evidence that the small independents are not being forced to the wall by the further concentration of output. With the exception of those concerns already mentioned as fading out of the picture the others are in good position. As a matter of fact, the industry is more compact and has in it fewer weak spots than at any time since the war. The small makers can thrive indefinitely if they do not become too ambitious and do not spend too much money trying to market their wares in all corners of the country.

The two greatest producers, Ford and General Motors, accounted for 2,487,000 units last year, or 68.1 per cent of the total as compared with 66 per cent of the total in 1922. Ford virtually matched all other makers combined last year and had exactly 47.8 per cent of the total as compared with 47 per cent the preceding year. General Motors proportion was 18 per cent in 1922 and 20 per cent in 1923. Its gain in point of units, therefore, was 2 per cent.

The largest individual percentage gain was 200 per cent made by Rickenbacker in its third year. Willys-Overland, including both Overland and Willys-Knight, gained 110 per cent and Jewett, also in its third year, 100 per cent. Chevrolet showed an increase of 92 per cent and 216,000 units. The Ford percentage gain was only 57, but it meant an increase of 630,000 units.

A remarkable showing was made by the Star with sales of 130,000 in its second year.

Success which has been achieved by Rickenbacker, Jewett and Star indicate that a market is open to new products which offer good quality plus manufacturing and merchandising experience.

Seven lines made in excess of 100,000 cars last year as against five in the preceding year. Their 1923 total was 2,971,000 or 82 per cent of the entire output. The production of the next three in the list was 59,000; 55,000 and 49,000, giving the first ten 86.1 of the grand total, a gain of 1.8 per cent over 1922, when the first ten made 84.3 per cent of the total. There was only one change in the list of names and that was in tenth place. The third line in 1922 was sixth last year and the sixth in 1922 was third in 1923. Twenty-five companies had a production of 10,000 or more last year and only nineteen the year before. Strangely enough, however, the number making 1000 or more was 53 in each year.

Variations in Quantity Production

Ford production by quarters last vear was: First, 340,000; second, 430,000; third, 456,000; fourth, 477,000.

Combined output of the other producers by quarters was: First, 450,000; second, 601,000; third, 456,000; fourth, 417,000.

Ford, therefore, made exactly as many cars as all other makers combined in the third quarter and 60,000 more in the last three months of the year.

The same general conditions which prevailed in the last three months of last year have held good thus far in 1924. The entire industry produced about 285,000 passenger cars in January, of which Ford made about 160,000. Total output in February was about 315,000, of which Ford made 170,000. Ford, therefore, made 330,000 in the first two months of this year while all other manufacturers combined turned out only 270,000, giving him 55 per cent of the grand total.

Chevrolet and other makers in the $500 or less class also increased their production this year, so it is apparent that the preponderance of cars in the lowest price class is fully as great as at any time last year.

Industry Need Not Ignore Man's Right to Pursuit of Happiness

Automobile contributes materially to pleasure of the American people and manufacturers should not be ashamed of the fact. Enjoying oneself is not a vice.

By Alvan Macauley
President, Packard Motor Car Co.

THE automobile industry has taken great pains for a number of years to demonstrate conclusively and to establish as a habit of thought on the part of the American public that those motor vehicles not obviously designed for the transportation of commodities are "passenger cars" and distinctly NOT "pleasure cars."

This effort, I am quite convinced, had its basis in sound psychology and good business. The original tendency to consider motor cars as toys to provide amusement to a wealthy and leisure class was highly detrimental to the development of an industry which such a picture totally misrepresented.

During those years in which the industry was striving to demonstrate that what it had to sell was transportation—one of the primary economic necessities—it would have been folly for the industry not to challenge the continued loose and inaccurate division of motor vehicles into trucks and "pleasure cars."

Facts, obvious to all upon consideration, are oftentimes lost sight of for lack of consideration. They can be obscured by popular slogans or phrases which indelibly impress and perpetuate misinformation.

"Passenger Car" Is Proper Term

The motor vehicle designed to carry passengers is properly a "passenger car," even if it is not a bus or taxicab, a jitney or a hearse. It carries passengers and certainly not necessarily for pleasure. The war made the distinction clear. "Pleasure cars" were luxuries in the manufacture of which it would have been wasteful and unpatriotic to devote labor and materials, freight cars and money. But "passenger cars" were essential to the carrying on of the every day work of the American people and as such properly were allowed to be produced without artificial limitation. But we all remember the tendency on the part of Senators and Congressmen, themselves users of motor vehicles, to accept the name as the verdict and to classify motor vehicles other than trucks and delivery cars as "pleasure cars" and as such a luxury to be banned, restricted or taxed to a degree higher than that for admitted necessities.

There can be no argument but that sound business and the now well recognized facts have justified the industry in bringing about a change in the popular designation of motor vehicle classifications. The power of the press to change habits of expression, the force of the industry's public contact through advertising and publicity in general, have been well exemplified in the almost universal adoption of the term "passenger car." The industry now produces "passenger cars" and trucks. That is as it should be.

But just because the automobile the average American purchases is a "passenger car" is it necessary for us to deny, conceal or minimize the fact that that same vehicle can be used for recreational purposes—yes, I will use that dread word, for "pleasure?"

Why Apologize for Pleasure?

Is it necessary for the industry to go so far as to insist that in reality there is no such thing possible as to use a motor car for pleasure? Must we tacitly apologize because some cars, or perhaps most cars, are used for a portion of the time by their owners for a purpose which has no immediate connection with an increase in their bank balances? Is it necessary to seek out and demonstrate, through some process of labyrinthine reasoning, an economic benefit to society or an increase in production as a justification for every breath of fresh air, every soul-inspiring view of rolling countryside, of lake or mountain peak, every delightful moment spent with nature or in communion with the open spaces? I do not think so.

I do not think it essential for us to discover some business benefit, however undeniable it may be, to justify every uplifting of the soul which may result from a panorama of beauty on the distant skyline. I do not believe there is any need for the industry to conceal or ignore or to confess and apologize for the fact that every passenger car possesses, in addition to its utilitarian value, potentialities for recreation, enjoyment and pleasure which to our forefathers would have made it seem a veritable magic carpet and which make it to this generation doubly valuable and no less useful or necessary.

Purpose of Driving Varies

I was talking with another automobile manufacturer the other day and in the course of our conversation I mentioned the admirable work done by many of the State highway departments in keeping their roadways open to travel during the winter months. I stated that to me it seemed certain that the cost of keeping the highways cleared of snow was only a small part of the vast sum saved through uninterrupted transportation of freight and passengers. I added that I wondered how much pleasure travel there was on these open winter roads and whether a general policy of keeping the highways open all winter would lead to the gradual development of winter pleasure travel or whether people refrained from travel for pleasure in the winter, because it was cold and facilities for outdoor enjoyment were

not as plentiful as in warm weather.

My conferee took me to task. "There is no 'pleasure travel,'" he said. "If a man is not strictly engaged in business while driving his motor car or if he has no direct business purpose on a given trip, he is, anyhow, increasing his efficiency, broadening his outlook, building up his health, learning things of value to him, clearing his mind of worry and putting himself in condition generally to work harder and accomplish more. Those things should not be called pleasure—they are a business necessity."

Self-Deception Is Common

We American business men seem to have an odd if harmless habit of deluding ourselves, of making excuses to ourselves about this question of "pleasure." I wonder if it is a national trait. I know men who like to play golf. They get a very real and intense pleasure on the fairways and the putting greens. But do they play golf for pleasure? Certainly not—they play golf to "increase their efficiency," to "better fit them for business problems," or some other such sound, practical reason. A sport model we made with a compartment in which the golf bag and sticks could be concealed instead of being carried in full view proved exceedingly popular with business men. Why?

I do not deny that golf accomplishes beneficial results. I know it does. But the *reason* I play golf is because it is a pleasure. For the same reason I shoot clay pigeons when I have the time or drive a motor car in the country.

Now, my point is, why must we business men always call pleasure by some other name? And are we in the industry justified in this rather obvious delusion by the universal existence of the same tendency in the United States? If so why take such pains to make products beautiful?

Why is not pleasure its own justification? Is there a real tendency in America to consider pleasure a waste of time unless it can be bolstered up with any business by-products which may be sufficiently obvious? Is it true that Americans recoil from the idea of pleasure as such? I doubt it.

And if we admit that pleasure need not necessarily be reprehensible, frivolous or vicious and that it has attractions of its own, quite aside from its benefits, for which the large majority of mankind are continually striving with only fair success, then why not call it pleasure and glory in the fact that our products add to the sum total of human happiness?

There can be no harm in meeting a question of this kind with the utmost frankness.

To my mind one of the things which makes the modern automobile the greatest boon to humanity ever devised by the human mind is the fact that it has a double value. It serves a dual purpose. It can either work or it can play or it can do both at once. Let us frankly admit that were the value of the motor vehicle utilitarian only, its use confined solely to the absolutely necessary transportation of the individual, our industry would not today rank second in importance in America. It is because the same tool now so universally recognized as essential to agriculture, industry and trade, provides also, ever ready for the available moment, a means of pleasure and enjoyment, that it has come to the dominant place it holds today.

Why should we taboo pleasure in detailing the services our industry renders to the world? Happiness is a virtue, not a vice. Pleasure and enjoyment are eagerly sought after and highly prized by every one. Why not admit it? Have not Americans progressed beyond that fanatical frame of mind of our estimable but narrow-minded forbears who saw even in the enjoyment of beauty a crime against Almighty God?

I believe that to the sane and sound modern individual the pursuit of happiness is the keynote of existence. If we are well and have used sufficient intelligence to find our proper niche in life, our work gives pleasure, our ambitions and aspirations give pleasure, our striving and accomplishments give pleasure, our every human contact is pleasant. Certainly all these things *should* be a pleasure as should our relaxations and amusement.

THE automotive industry has been entirely right, Mr. Macauley says, in fostering use of the term "passenger car," because basically speaking the automobile is a primary economic necessity and possesses abundant utility value.

On the other hand, pleasure is not a vice, he points out, and there is no reason why anybody should deny that motor vehicles contribute to the pleasure and happiness, as well as to the efficiency, of human existence. The Packard president doesn't believe that every enjoyment need be justified by some business reason. He even admits that he plays golf primarily because it is a pleasure and that its physical and mental benefits are incidental.

I believe America is developing a culture which can appreciate beauty for its own sake, which can put dollars to other uses than to breed new dollars, which can devote time and superabundant energy to the amenities and to the pleasure of existence without self apology.

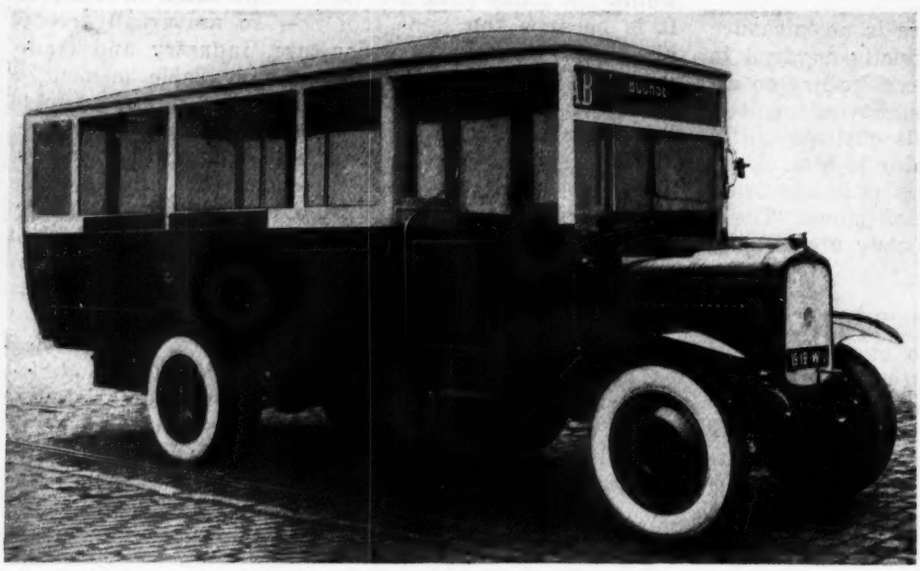
Over half of America's thirteen million motor cars are owned by country people or those who live in towns of less than 5000 inhabitants. A leader of a national farm organization recently said, "The factor of pleasure to the people who dwell on the land and feed the nation is a factor of large significance. The automobile, and the opportunity to use it for its social purpose, have a part in this and that which fends the nation against the depopulation of our farms cannot be considered a frivolity."

Over a million people visited our nineteen National Parks in motor cars last year and our Government is rightly and successfully endeavoring to increase the number of motor visitors. Prior to ten years ago this travel was nil. Millions of Americans of a generation just passed were denied a privilege and a pleasure which the automobile and the modern highway open to all.

Vehicle Value Is Twofold

While I would not by any means lay primary emphasis upon the pleasure of owning a motor car and have no thought of suggesting that they be merchandized as pure pleasure vehicles on a plane with comic opera or detective stories, I do feel that the industry while laying proper emphasis on the economic value of the motor car as a necessity and as an indispensable servant of our modern civilization, should not endeavor to conceal or deny that tremendous advantage possessed by motor cars alone in all the field of business and personal necessities—its infinite pleasure possibilities.

There is a joy in motoring.



Interior and exterior views of new 25-passenger Paris express bus built by S. O. M. U. A. for service in Paris. The body is substantially identical with that used also on the Renault chassis which is made for the same operating company

Pneumatic-Tired Express Bus Introduced in Paris

Chassis are built by Renault and S. O. M. U. A. to specifications of operators. Will run on selected routes and handle through traffic. Taxi speeds to be approximated at one-fifth the fare.

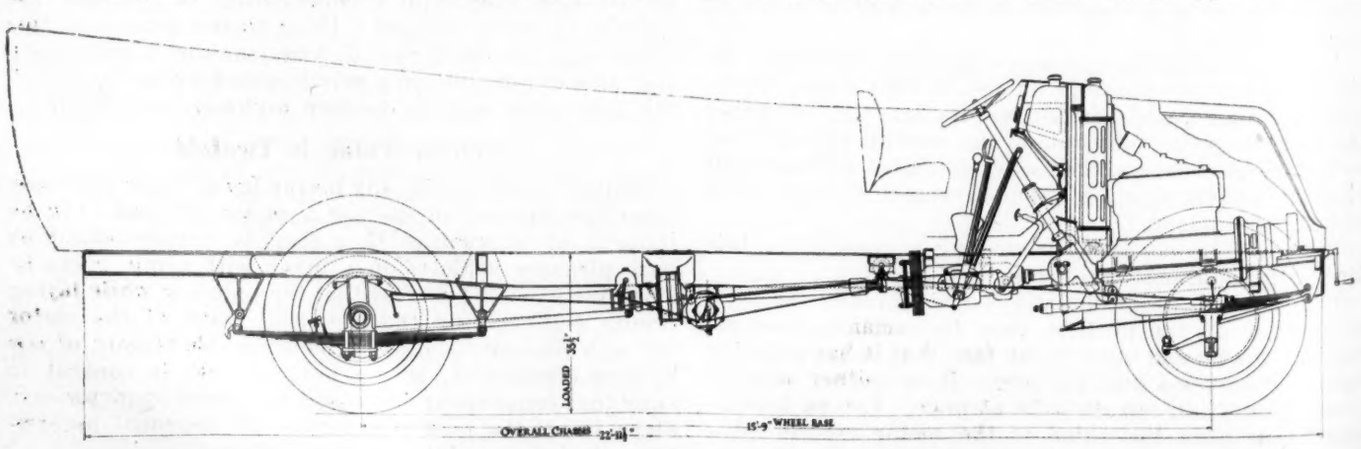
By W. F. Bradley

PNEUMATIC-TIRED motor buses having a modern four-wheel braking system, carrying 25 passengers, and running at the maximum speed of 22 m.p.h. allowed under French law for vehicles of more than 4 tons dead weight, have been put into service on the streets of Paris by the company having a monopoly of all surface lines.

The new buses have been built by the Renault and the S. O. M. U. A. companies to the omnibus company's specifications and, while differing in their chassis features, have the same type of body. The main entrance is at the forward end by the side of the driver, who collects fares. The new buses will run on selected routes, carrying a large proportion of passengers from terminus to terminus, and thus will have very few stopping points. It is estimated that they can make as high an average speed on a cross-city run as a taxicab, and at one-fifth the fare.

One of the outstanding features of the Renault chassis is its service brake on all four wheels operated through a servo mechanism. These brakes are Perrot type, but the friction servo mechanism is driven by worm gearing from the main drive shaft. There is a hand-operated brake on a gearset drum, another hand-operated brake on the rear wheel drums, and a separate emergency level control inside the bus for the same set of brakes.

A four-cylinder 100 by 160 mm. engine is mounted ahead of the radiator. It is an L-head type with auto-



Side elevation of Renault chassis designed for express bus service in Paris. Note use of radius rod on front axle, employed to assist in taking reaction of front wheel brakes

matic advance high tension magneto and a governor on the throttle limiting the engine speed to 1600 r.p.m. Unlike the other Paris buses, the gearbox provides four speeds ahead, and final drive is by a single reduction bevel axle. The four gears give speeds of 6½, 11, 17 and 29 m.p.h. at maximum engine speed allowed by the governor.

Semi-elliptic springs are used front and rear, those under the rear axle being shackled at both ends, for, unlike previous Renault chassis, drive and torque are transmitted through the spherical end of the propeller shaft housing carried in a reinforced central cross-frame member. The drive shaft is open from the sphere to the gearbox, this shaft having a steel disk coupling at its forward end and a brake servo mechanism at its rear end.

Wheel equipment is Michelin steel disks with 1085 by 185 mm. tires, those at the rear being dual. Wheelbase is 162 in., and track 72 in. in front and 66 in. at the rear. The chassis overhangs the rear axle 61 in., while the body overhang is about 15 in. greater. Total length of the bus is 23 ft.

The American Automobile (Overseas Edition)

AS an extension of its activities in the automotive export field, the Class Journal Co. will begin publication on April 15 of a new business magazine, THE AMERICAN AUTOMOBILE (*Overseas Edition*). Circulating in all sections of the world where English is the common language or is understood commercially, the new publication will be similar in scope and purpose to *El Automovil Americano*, which has been published by this company for many years as an automotive business paper for dealers, distributors, garage men and service station operators in the Spanish and Portuguese speaking territories.

The AMERICAN AUTOMOBILE (*Overseas Edition*) will appear monthly, carrying to the expanding trade abroad descriptions of American-made automotive products, news of the industry and service and merchandising information of a particular export character. With the international sales of automotive equipment having reached a volume of slightly more than $260,000,000 in 1923, there has been established abroad an automotive market which last year required one month's production to fill its steadily enlarging demands. THE AMERICAN AUTOMOBILE (*Overseas Edition*) will serve this overseas distribution system and, with *El Automovil Americano* as its companion publication, will reach approximately 90 per cent of the world's automobile markets outside of this country and Canada.

The new publication will circulate in nearly all sections of the world, except those now covered by *El Automovil Americano*. The countries of its major circulation, in line with the development of automobile sales, will be Australia, New Zealand, Great Britain (including Ireland), India, Union of South Africa, Hawaii, the Malay States, Sweden, Norway, Denmark, Dutch East Indies, Holland, Japan and China. It will circulate also in British Guiana, British East Africa, British West Africa, British West Indies, Finland, Malta, Persia, Siam, Belgium, Cyprus, Ceylon, Czechoslovakia, Egypt, Esthonia, Fiji Islands, Ceylon, France, French West Africa, Germany, Italy, Jugoslavia, Mauritius, Latvia, Morocco, Palestine, Poland, Samoa, Sudan, Sumatra, Switzerland, Syria and Turkey.

The first issue, appearing on April 15, will bear the date of May. It will have an initial circulation of 5000, all of which will be within the trade except for several hundred copies sent to American Consuls, representatives of the Department of Commerce and other officials in the foreign territories. It will be published under the supervision of the staff now in charge of *El Automovil Americano* and, of course, in conjunction with the other publications of both the Class Journal Co. and the Chilton Co. The purpose of THE AMERICAN AUTOMOBILE (*Overseas Edition*) is to carry to a world-wide field the same service which is being given to readers in the United States, Canada and the Spanish and Portuguese speaking territories of these long-established automobile journals.

Difficult Problems Involved in Power Braking for Motor Vehicles

Part II

Westinghouse railcar equipment consists of a mechanically driven air compressor which furnishes pressure for brake application. Other types discussed.

By P. M. Heldt

THE Westinghouse railcar equipment comprises a mechanically-driven air compressor which furnishes the compressed air needed for brake application; a compressor governor which automatically controls the operation of the compressor between predetermined minimum and maximum pressures; two main tanks in which the compressed air is stored; a safety valve connected to the compressor discharge; a brake valve; a duplex air gage, an emergency valve, a brake cylinder with piston and piston rod, a conductor's valve, a main tank cut-off valve and a number of minor parts and accessories.

Two lines of pipe, the straight-air application and release pipe and the emergency pipe, are used, with suitable hose and couplings at the rear end of the car if a trailer is carried. There are cut-out cocks in these pipes just back of the hose connections, which are closed when a single car is operated and opened when a trailer is attached.

IN the first installment of this article the history of power braking in this country was traced, reasons for the present interest in the subject were outlined and a description was given of the Westinghouse air brake for road vehicles. In the present concluding installment are descriptions of Westinghouse air brake equipment for railcars and the Simplex vacuum brake for passenger cars and trucks. Some of the problems involved in the design of efficient power braking systems are pointed out.

The air compressor (Fig. 1) is of the two-cylinder horizontal type and is driven from the power take-off on the transmission through a disk-type of friction clutch. It does not run continuously but only for such time as is necessary to maintain the tank pressure between predetermined limits. When the pressure in the main tank has been reduced to 50 lb. per sq. in. by brake application or leakage, the compressor is automatically started, and it then continues operating until the pressure in the tank reaches 65 lb. per sq. in., when it is automatically stopped.

For connecting the compressor to and disconnecting it from the power take-off, use is made of a pneumatically operated friction clutch. Referring to the sectional view of the clutch in Fig. 2, it will be seen that there is a drive shaft *A* which is connected to the power take-off through a cushion coupling *B*. Keyed to the drive shaft is a spider *C* having a set of pins *D* engaging in holes in the metal plate *E*, to each side of which are secured Raybestos disks *F*. Secured to the clutch shaft *P*, which carries the compressor pinion, is a fixed clutch ring *G* having a movable ring *H* mounted upon its hub. Also attached to this shaft is a pressure ring guide *Z* to which are fulcrumed the set of three levers *I* and upon which is movably mounted the pressure ring *J*, actuated by spring *K*. Opposed to the action of this spring is the yoke lever *O* having shoes *N* engaging groove *M* of the pressure ring and actuated by air pressure on the diaphragm *Q* in the cylinder *S*. From the outlet *R* a pipe connects to the automatic governor which controls the admission of air to and the exhaust of air from cylinder *S*.

When the pressure in the main tank has fallen to the predetermined minimum of 50 lb. and the governor has cut in, as will be described later, thereby exhausting air from the cylinder, spring *K* will actuate pressure ring *J*, the levers *I* and the movable ring *H*, so as to firmly clamp friction disc *E* between plates *G* and *H*. The clutch shaft then rotates with the power shaft, driving the compressor.

When the air pressure has been restored to the predetermined maximum, the governor cuts out, as will be described later, thereby admitting air to the cylinder *S*. This air pressure in the cylinder will deflect diaphragm *Q* and impart motion to the yoke lever through its connected members. The yoke lever, operating around its fulcrum pin, will cause the pressure ring *J* to compress spring *K* and relieve the pressure from the clutch levers *I*, and, consequently, from the movable ring plate *H*, thereby permitting the springs *L* to move the movable plate to a position which will release the friction disk *E*, permitting it to rotate freely between plates *G* and *H*, disconnecting the drive shaft from the clutch shaft and stopping the compressor.

A diagrammatic sectional view of the governor is shown in Fig. 3. This device consists of two parts, viz., a pipe bracket with strainer and a regulating portion, which is of the pneumatic double safety valve type. Admission of air to and exhaust from the air cylinder of the clutch is controlled by the regulating portion. Air from the main tank enters chamber *A* of the pipe bracket portion at the port marked "Main tank" and flows through the strainer and passages marked *B*, *C* and *D* to the seat of cut-in valve *E*; also to chamber *F* and the seat of the cut-out valve *G*. Suppose that both springs *H* exert the same pressure. The

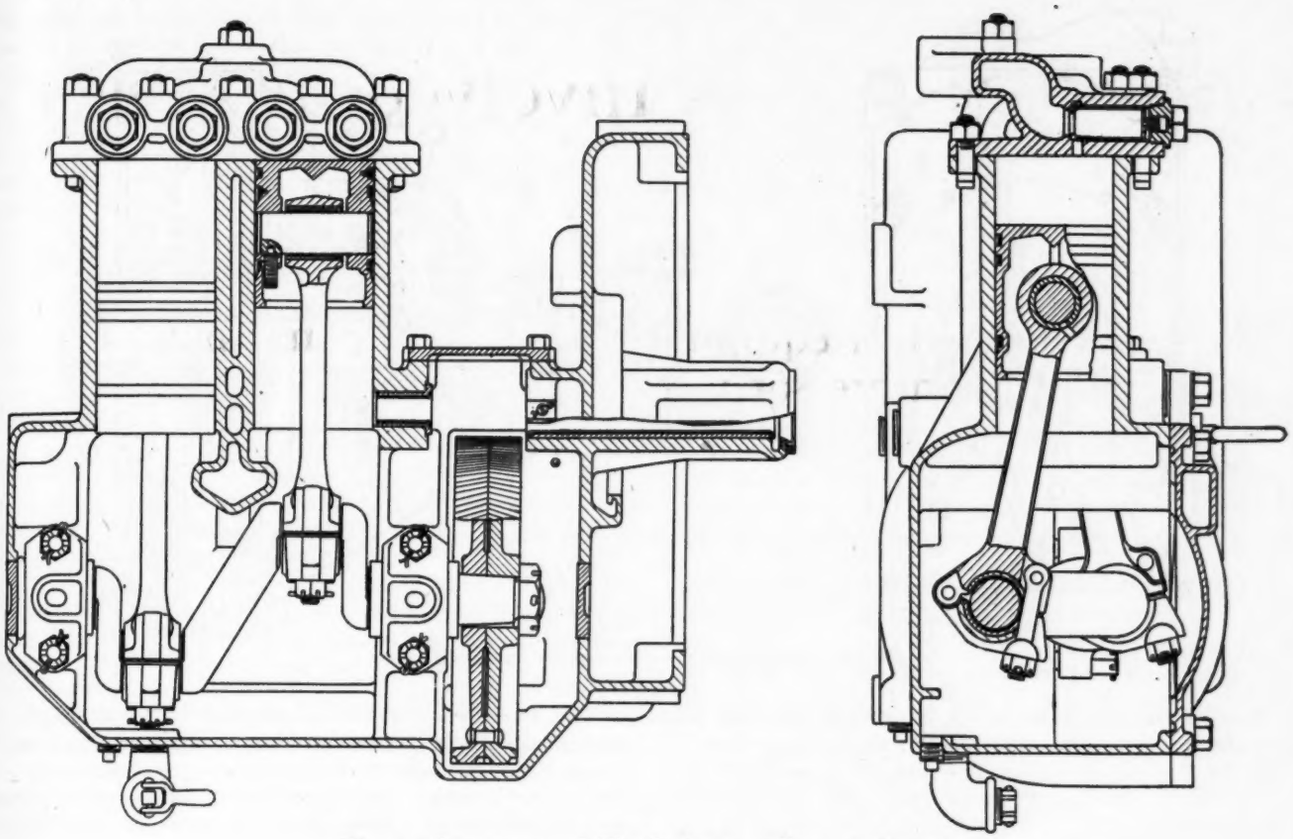


Fig. 1—Compressor of Westinghouse railcar equipment

area of the cut-out valve *G* exposed to main tank pressure in the cavity *F* is greater than the area of cut-in valve *E* exposed to main tank pressure in passage *D*. Consequently, as the main-tank pressure rises, cut-out valve *G* will be opened before cut-in valve *E*.

Action of the Governor

The shape of the seat of cut-out valve *G* is such that as soon as the valve leaves the seat in the bushing, the area exposed to main-tank pressure is greatly increased and the valve moves quickly to its extreme position, which is determined by the spring box. As the cut-out valve moves from its seat, it uncovers port *I* in the bushing leading to the annular space around cut-in valve *E*. The area of cut-in valve *E* thus exposed to main-tank, added to that exposed by passage *D*, is sufficient to overcome the pressure of the spring, and cut-in valve *E* moves quickly to its extreme position, seating at *J*, thus preventing the escape of air to chamber *K* and to the exhaust "*Exh.*"

When cut-in valve *E* leaves its seat it uncovers port *L*, and main-tank pressure then is communicated through port *M* to the cut-out spring box, whereby the pressure on both sides of the cut-out valve *G* is equalized. The spring on the valve then moves it promptly to its original position. Cut-in valve *E* is now open, so that main-tank pressure is communicated from port *D* through ports *L*, *M*, *N* and *O* to chamber *P* in the pipe bracket and thence to the air cylinder of the clutch, throwing out the clutch and stopping the compressor.

The parts will remain in the cut-out position until the pressure in the main tank has fallen to such a value that the pressure on the entire lower area of the cut-in valve *E* exposed to main-tank air through passage *D* is slightly less than the pressure on top exerted by main-tank air on the partial area (through passage *Q*) and the cut-in valve spring. The cut-in valve will then leave its seat at *J*. This permits of the air from chamber *P* and the clutch cylinder to flow through passage *Q*, past seat *J* and into chamber *K* more quickly than it can escape through the exhaust port. Thus the pressures on opposite sides of the cut-in valve *E* tend to equalize and the spring quickly moves valve *E* to its seat. Then, in addition to flowing from chamber *P* through passages *Q* and *J*, chamber *K* and exhaust "*Exh*," the air flows back through passages *O*, *N*, *M*, past seat *J* to chamber *K* and to the exhaust until all is released from chamber *P* and the clutch cylinder. The clutch piston then returns to its cut-in position, starting the compressor, and the operation previously described is repeated.

A groove in the bushing of the cut-out valve connects port *I* with the annular groove *R* in the cut-out valve *G*, which in turn connects with passage *S* leading to passage *Q*. If, as a result of leakage, air pressure should accumulate in passage *Q* while the governor is in the cut-in position, the air will escape past seat *J* to the chamber *K* and the exhaust. These grooves and ports assure atmospheric pressure in the annular space around cut-in valve *E* whenever the valve is on its leather seat, thus preventing slight leakages past the cut-in valve and cut-out valve seats from causing any erratic action or premature operation of the governor.

Brake Control Valve

The brake valve used with this equipment is of the rotary registering type and has a removable handle. This valve has five positions, as follows:

1. Release position, in which air from the tank pipe may flow into the emergency pipe and the straight-air application and release pipe is opened to the atmosphere.

2. Lap position, in which the emergency pipe is connected to the tank pipe, the same as in the release position, but the straight-air application and release pipe is closed.

3. Service position (one car), in which the tank pipe communicates with the straight-air application and release pipe through a relatively small opening. The emergency pipe is also connected to the tank pipe.

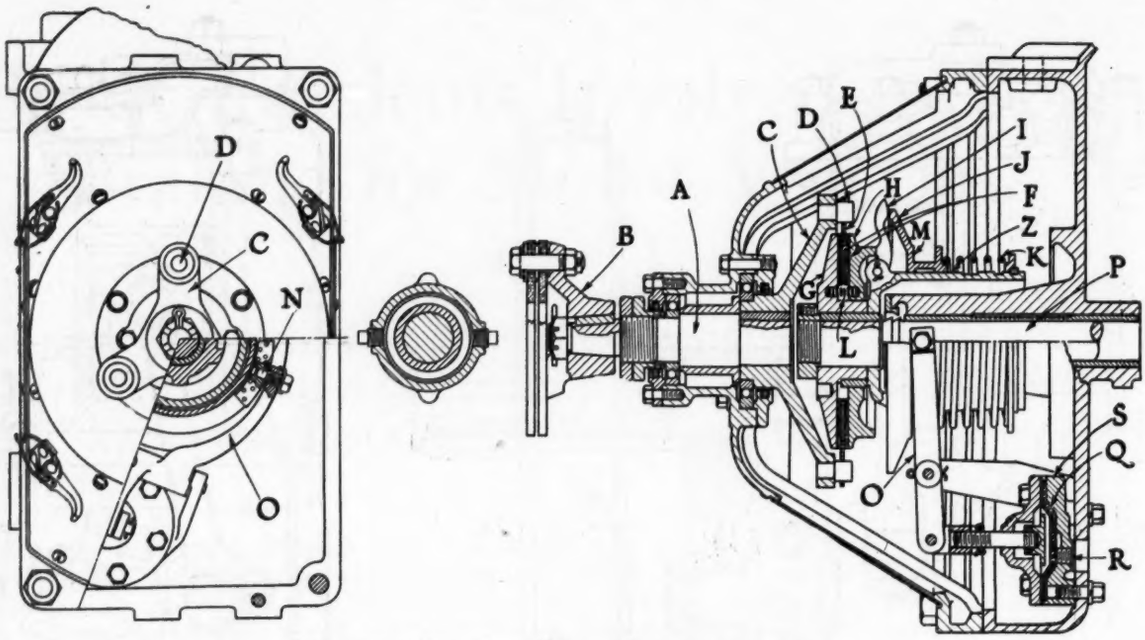


Fig. 2—Automatic friction clutch for compressor

4. Service position (two cars), in which the tank pipe communicates with the straight-air application and release pipe through a larger opening, thus permitting a more rapid air flow. The emergency pipe is connected to the tank pipe.

5. Emergency position, in which the emergency pipe is opened to the atmosphere. The straight-air application and release pipe is closed.

In addition to the brake valve the equipment comprises an emergency valve the object of which is to permit the air from the tank to fill the brake cylinders more rapidly and thus effect a quicker stop. When the brake valve is set in the emergency position the emergency valve operates, establishing direct communication through it from the tank to the brake cylinder. An additional port is provided so that when the valve is in the emergency position main-tank air is admitted to the sand pipe, making automatic sanding of the rails possible. If this feature is not desired, the sand pipe connection in the valve bracket may be closed by a plug.

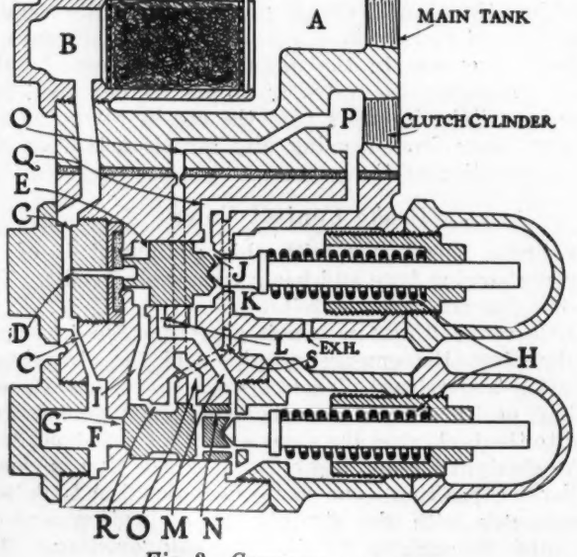


Fig. 3—Compressor governor

The emergency valve is carried by a bracket. The emergency, tank, brake cylinder, straight-air and sanding pipes are not connected directly to the emergency valve but to the bracket; consequently the valve can be removed for inspection or repairs without breaking the pipe connections.

In connection with the railcar equipment, use is made of brake cylinders and pistons instead of diaphragm chambers. As may be seen from the sectional view, the piston has a hollow rod in which there is a solid push rod which is connected to the levers of the brake rigging. The solid rod being free within the hollow piston rod, the brakes can be applied by hand, if desired, without moving the piston.

To insure that the pushrod shall fully return home when the brakes are released, the brake rigging must be as free from friction as possible, and adequate clearance must be provided for both the hand and the air brake system. The release spring surrounding the hollow piston rod forces the piston to the release position when the air is exhausted from the opposite end of the cylinder. The piston is provided with a packing cup which makes it airtight in the cylinder.

A conductor's valve, an additional safety device, is provided and may be located at any convenient point of the car, preferably with a cord attached to its handle and running the length of the car. When this valve is opened the air in the emergency pipe flows directly through it to the atmosphere, setting the brakes in the emergency position. The conductor's valve remains open and must be closed by hand.

Simplex Vacuum Brake

A brake operated by the vacuum in the inlet manifold is being distributed by the Simplex Air Brake Sales Corp. of New York. The general principles of the vacuum brake were explained in the first part of this article, in connection with the description of the Prest-O-Lite brake. The Simplex, however, possesses a number of original features, which will be described by reference to the illustrations herewith.

Two designs have been developed, one for passenger cars and the other for trucks and other heavy commercial vehicles. Owing to the fact that the vacuum in the inlet manifold is limited to about 10 lb. p. sq. in., a considerable

area must be provided for this pressure to act on, in order that it may produce sufficient total pressure to apply the brakes with the necessary force under all conditions. To avoid the use of a cylinder of abnormal diameter, a number of cylinders are placed in series, each containing a piston, with all pistons mounted on the same rod, to which the brake linkage is attached. The passenger car type has two cylinders and the truck type four.

When the Simplex brake operating mechanism is installed on a car the original brakes are retained. The valve by which communication between the inlet manifold and brake cylinders is controlled is mounted on the piston rod and is connected to the regular brake pedal by a light pull rod. By reference to the sectional view of the brake cylinder it will be seen that the piston rod is hollow and has an opening in its wall directly to the left of each of the four pistons.

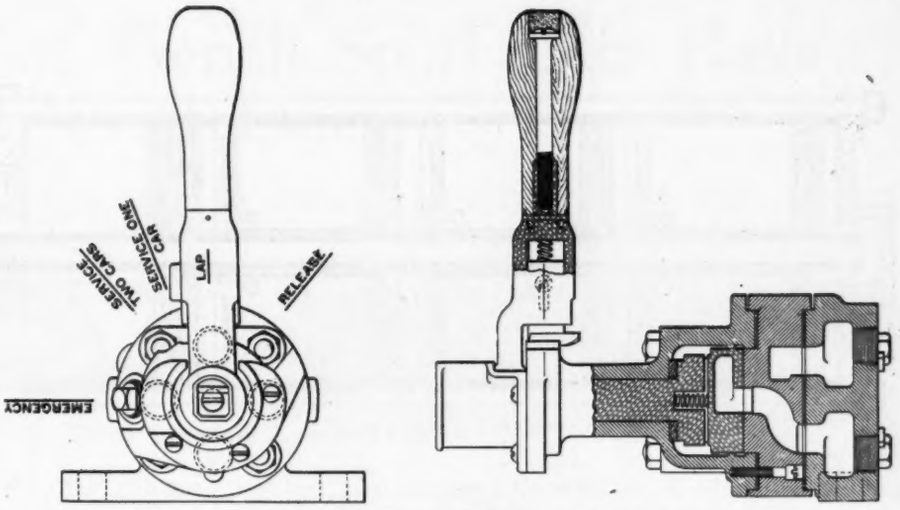


Fig. 4—Hand control valve for Westinghouse air brake for motor railcars

Operation of Simplex Brake

The control valve can be slid along the piston rod toward the left, against the pressure of a light spring, until it establishes communication with the inside of the hollow rod, through a port located immediately to the left of the plug in the rod. Each of the four cylinders is then in communication with the inlet manifold and the pressure on the left side of the piston within it is then reduced to that in the manifold.

The right-hand end of each cylinder is open to the atmosphere and the difference in pressure on their two sides causes the pistons to move to the left and thus to apply the brakes. Special advantages are claimed for the arrangement of the control valve as thus described. As soon as the valve is moved far enough to the left to establish communication between the inlet manifold and the brake cylinders, the pistons within these cylinders (and with them the piston rod) begin to move to the left, which has a tendency to close the control valve again. The opening of the valve therefore should be more gradual than if one part of the valve were stationary, and this is claimed to result in a smoother, more gradual application of the brakes.

It will be seen that three of the cylinders are open to the atmosphere through an opening in their walls near their right-hand end, but the cylinder at the right has a nipple screwed into its head from which a hose connection extends to a nipple screwed into the end of the piston rod. When the control valve is in the "off" position, as shown in the drawing, the inlet manifold vacuum is communicated to the rear of the piston in the right-hand cylinder and therefore tends to return the pistons and the brakes to the "off" position. On the contrary, if the control valve is in the "on" position, the right-hand end of the right cylinder is opened to the atmosphere through the control valve, the same as the corresponding ends of the other three cylinders.

The control valve is connected to the brake pedal in such a manner that the brakes go on by air pressure during the first part of the pedal stroke. Should anything go wrong with the power brake, as, for instance, the coming loose of a hose connection, it is only necessary for the driver to depress the same pedal further to apply the brakes directly by muscular energy.

In addition to the sectional view of the truck type of brake cylinder we show a photograph of a sectioned model of the passenger car type. The truck type cylinder is 6 in. in diameter and has an overall length of about 21 in.

Power Braking in General

On the whole, the problem of power brakes for motor vehicles is a great deal more difficult than it appears to be at first sight. A number of systems are being developed in various parts of the country, but it necessarily takes some time to reach a stage where regular production is warranted.

The necessary pressure is generally obtained from one of the engine cylinders, and is controlled by a so-called three-way valve which in one position places the pressure tank in communication with the brake cylinders or brake chambers and in the other position opens the brake cylinders or chambers to the atmosphere.

There is no doubt that great braking power can be obtained in this way without abnormal physical effort on the part of the operator. The objection may be raised to some systems that the driver has no real control over the braking power, that the pressure with which the brakes

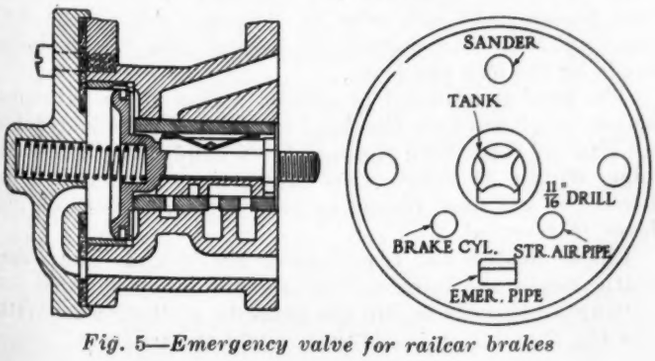


Fig. 5—Emergency valve for railcar brakes

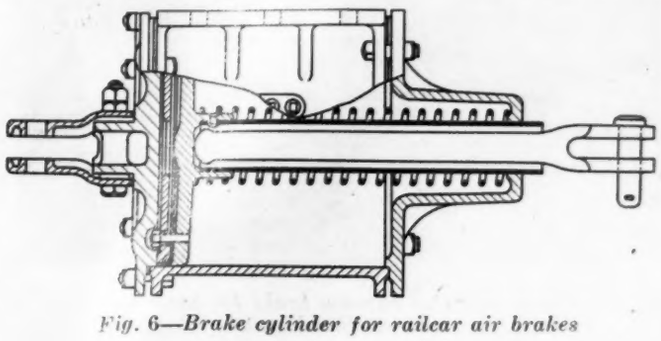


Fig. 6—Brake cylinder for railcar air brakes

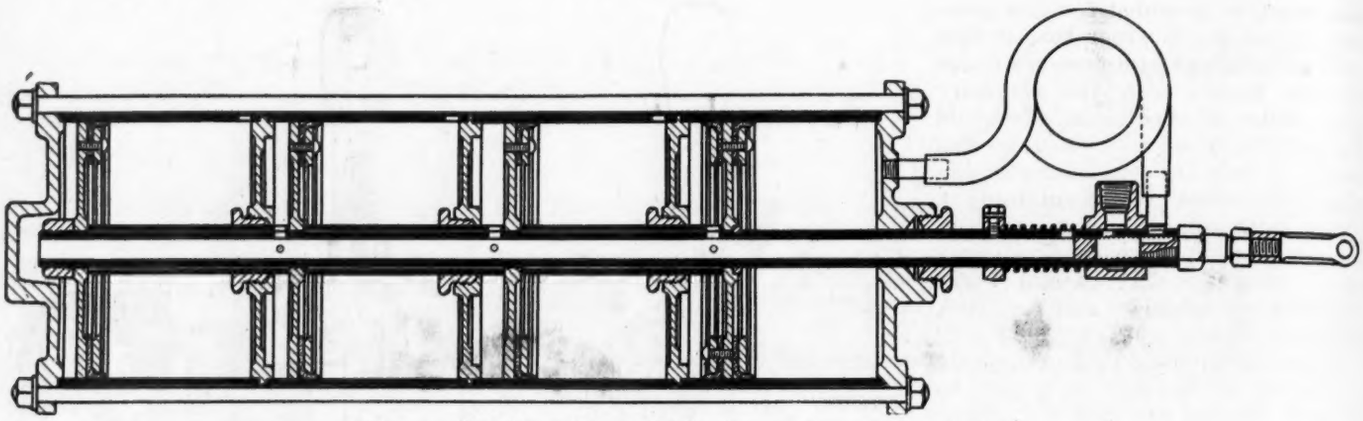


Fig. 7—Simplex vacuum brake for trucks, sectional view

are applied to the drums is at all times a direct multiple of the pressure within the air cylinder and that he cannot change this relation. The most that he can do is to alternately apply and release the brakes.

One answer to this objection is that if only a slight braking force is wanted the driver may use his foot brake, which in that case does not require any great effort. The air brake is needed mainly for quick stops, and the full tank pressure gives substantially the quickest possible stop.

In this connection it must be remembered, however, that brakes are used not only for bringing the car to a stop, but also for holding it in check on a down grade. In the latter case, of course, the wheels must be allowed to continue to turn, hence the braking force must be very nicely graduated in accordance with the ground adherence of the tires. It is very tiring to hold on the brakes while descending long, steep mountain grades, and a power brake which does not meet this condition would hardly prove satisfactory for general application.

Overcoming Tendency to Jam

Lack of control also may evidence itself in "jamming" of the brakes. With power brakes, the "breaking loose" resistance of the brake system is necessarily somewhat greater than with plain hand brakes, and in addition there is greater inertia of moving parts. The "breaking loose" resistance plays a particularly important part in winter time when the oil in the bearings is congealed. By the time the parts have "broken loose" the pressure on the brake piston has built up and when the slack in the brakes has been taken up the pistons, etc., have acquired considerable momentum, both of which factors add to the rapidity with which the brakes go on. Overcoming this tendency to jam is one of the important problems that confront the designer of power brakes.

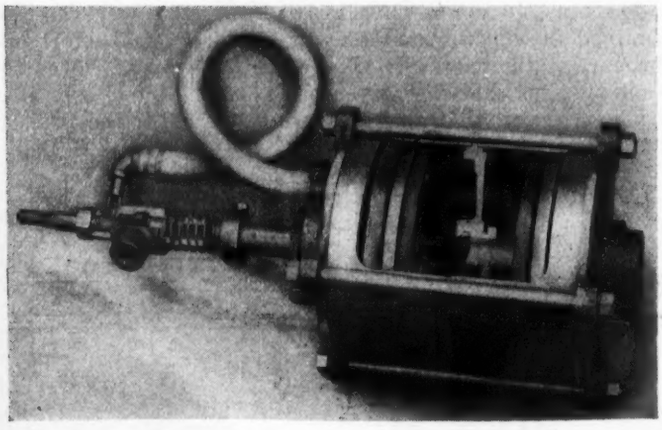
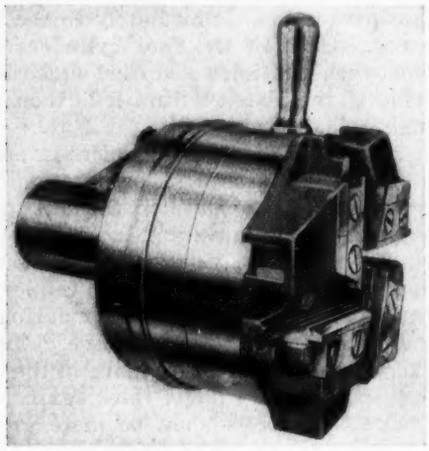


Fig. 8—Simplex vacuum brake for passenger cars, sectioned model

New Landis Die Head

HEREAFTER the Landis automatic die head, manufactured by the Landis Machine Co., Waynesboro, Pa., for use on turret lathes and hand operated screw machines, will be known as the Landmatic die head. In this head the chasers are supported on the face, which give ready access to them when they have to be removed for grinding or for exchange for another size.



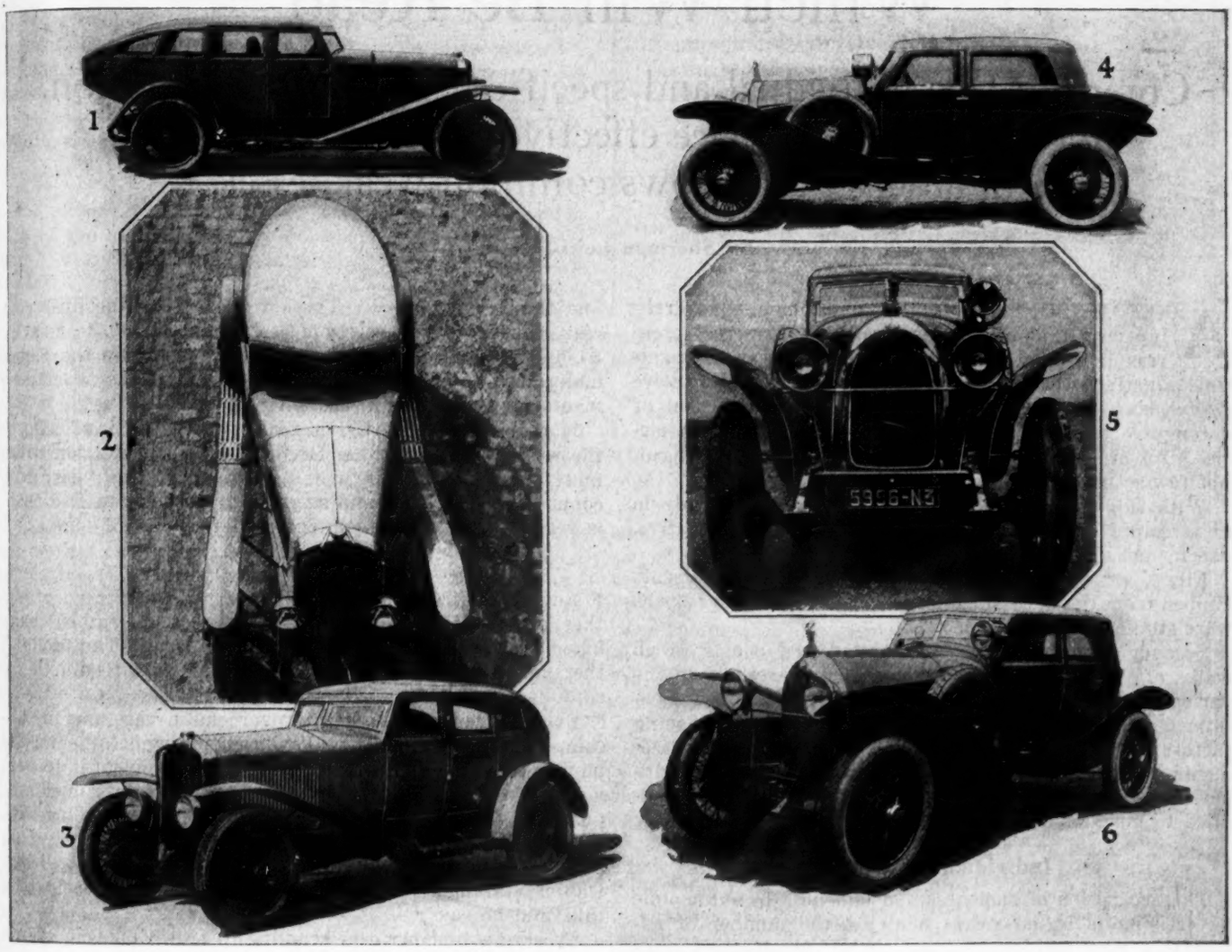
Landis die head

The head opens automatically when the forward motion of the carriage is retarded and is closed by hand. It is locked by the engagement of two hardened cylindrical lock pins in hardened bushings. On the 1¼, 2 and 3 in. heads the roughing and finishing cuts are obtained by the movements of the lock pin lever. When cutting threads in one pass, both lock pins are engaged; when cutting in two passes, both lock pins are engaged during the first pass and only one during the second, the change being made by the lock pin lever.

The head is adjusted to size by means of an adjusting screw which engages the head body. It is graduated for all sizes of bolts, both right and left hand, and right hand pipe, within its range. To adjust the 1¼, 2 and 3 in. heads for left hand threading the position of the lock pin lever is reversed.

Chaser holders and trunnions on the ⅝ and ⅞ in. automatic heads are integral, the one set being suitable for cutting all threads within the capacity of the head. With the 1¼, 2 and 3 in. heads these parts are separate.

Sedan Models of French Sport Cars Have Novel Lines



Two examples of light weight closed bodies on French sporting chassis:
1, 2 and 3—Views of four-door four-passenger sedan, wood and aluminum construction, on Peugeot chassis
4, 5 and 6—Two-door, four-passenger sedan on Lorraine-Dietrich chassis

THE growing popularity of the sedan body over the phaeton now is extending in France to the sporting type body. Partisans of sporting automobiles are asking for all the comforts of the sedan combined with the speed, low weight and rapid acceleration of the light runabout.

Two good examples of this tendency on the part of French sportsmen to refuse to be satisfied with the discomfort of an open body are to be found in a special body on a sporting type Peugeot chassis, and in a four-seater sedan on a six-cylinder Lorraine-Dietrich chassis, both built to the order and designs of ex-aviators.

The body on the Peugeot is a four-door four-passenger sedan with a wood frame and aluminum paneling. The lines follow closely those of an airplane fuselage. The glass front, which slopes rearwards and is slightly V-shape, is hinged along the upper edge and is rounded into the turtle back roof, the extremity of which drops down to join the pointed tail. In addition to the glass window in each door, there are two windows on each side behind the rear door.

Height from the ground to the summit of the roof is 5 ft. 7 in. This, with cushions placed directly on the floor boards, gives just sufficient headroom for an ordinary person when seated. The spare wheel is carried across the car on a bracket behind the driver's seat and there is space for tools and baggage in the pointed tail. Internal wood fittings are of polished walnut, with green leather upholstery and lining. The roof, which has longitudinal and transverse walnut ribs, is lined with leather. Weight of the body and all equipment is 1045 lb. With a 30 hp. Peugeot sleeve valve engine the car is capable of rather more than 80 m.p.h. over the measured mile.

A two-door four-passenger sporting sedan built by the Janoir Company on a Lorraine-Dietrich chassis, has the same front aspect as that on the Peugeot, but the roof is cut short at a point just over the rear axle and the pointed rear constitutes a deck continuing the belt line. This body has a single door each side, with access to the rear seats by folding and hinging forward the right-hand front seat.

How to Write Automobile Advertising Which Will Be Read

Copy must be individual and specific if it is to get attention. Pictures cannot replace effective heading. Analysis of actual cases shows common weaknesses.

By Sherman Lewis Smith

A COMPARISON of present-day automobile advertising with that done ten years ago shows real progress in layout and artistic effect but at the same time a distinct weakness in much of the copy. Automotive *engineering* has made great strides but a good deal of automotive *advertising* has been running around in circles. Advertising men admit that it has fallen into a rut, but few seem to know what to do about it.

With this in mind the writer made a careful study in an attempt to arrive at some useful, or at least speculative, conclusions. The research was made in two ways:

First, some 250 separate automobile advertisements clipped from the newspapers over a period of three months were studied and analyzed.

Second, a large number of disinterested people in all walks of life were approached and their reactions to the various automobile advertisements then current were obtained. Every effort was made to eliminate influencing factors in getting at the real effectiveness of the advertisements and, while conclusions have to do primarily with national newspaper advertising, many of them can be applied to magazine copy as well.

Individuality Lacking

The accusation of sameness and lameness in automobile advertising is by no means new, yet the number of advertisers who continue to say things about their cars which could be said with equal truth and selling strength about almost any car made is beyond explanation. In the 250 advertisements analyzed in our research twenty-three, or nearly 10 per cent, could have been used for almost any automobile under the sun by merely changing the name and the prices quoted. These represented nine different cars ranging in price from less than $1,000 to nearly $4,000. Fourteen were for two cars made by the same manufacturer and comprised all but five of the advertisements for these cars in the entire list.

Is automobile advertising really worth reading? Does the reader learn anything from it? Perhaps balloon tires and four-wheel brakes will save the day, this year, but count back five years and see how much you can find that is really worth while from the reader's point of view.

Too Much Guess Work

Advertising writers are still too theoretical; too often they are shooting in the dark. They *guess*, rather than *know* what effect their copy is going to have. They follow the same group of time-worn rules and, as a result, their copy has a striking similarity.

Every advertisement has to overcome a vast amount of competition for attention. While people who contemplate buying will read the advertisements, the problem is to get your message to those who do not contemplate immediate purchase and influence their choice when the buying day comes.

Effectiveness can be determined in advance. Prof. Daniel Starch, of Harvard University, has demonstrated this, and he says:

"Tests have shown the headline to be a very important element in an advertisement—an element probably more important than most persons realize." Other investigators bear him out in a further statement: "The results show that certain elements * * * are much more important than others. Specifically, the *attention value* and the *headline* is each nearly twice as important as the *text* of the advertisement."

Price a Major Factor

He is speaking of advertising in general, and our investigation disclosed another important element in automobile advertising—that of *price*. We asked men who own expensive cars; we asked men who own Fords; we asked men who do not own any car "yet," and almost invariably PRICE was found to be a determining factor in securing attention for an automobile advertisement. Price does not necessarily determine the actual purchase but it does instantly set down a car as being within the class that interests the reader or that big outside class over which he cannot afford to waste his time.

It is apparent that there is an amazing amount of good copy which somehow does not get itself read. At the outset it is obvious that the automobile advertisement is no place for the essayist to practice. A 450-word essay describing seven features may do in a catalog—perhaps—

THE criticism that automobile advertising lacks definiteness and individuality is common. The interchangeability of much of the copy used in selling motor cars has been pointed out frequently.

But it is one thing to point out an evil and another to supply a remedy for it.

The writer of this article has done both. He does not suggest any cure-all for automotive advertising ills, but he does show in a practical way how a good bit of current copy can be improved. His comments are constructive.

but it is decidedly out of place in a newspaper advertisement. Yet good copy is not everything. Rolls-Royce copy is usually well written, yet we found in our research that it was almost never read by the people we approached because they knew the car was out of their range. Here again the question of price looms.

Price is almost the first thing the average reader looks for before reading an automobile advertisement. A close second is the name of the car. A new name may attract his attention and arouse his curiosity, but there are any number of familiar names which mean nothing to the advertisement reader. This indicates that his interest must first be gained by some more subtle means.

Pictures Tell the Story

The picture of an automobile is an almost indispensable part of the copy, be it in a newspaper or any other medium. A good advertisement without a picture will often be passed over without the reader realizing that it is motor car copy.

Yet the picture cannot replace the heading. *The picture identifies while the heading attracts.* Both are important. A well laid-out advertisement with a good picture and good typography, but minus a heading, failed to attract a single reader in our investigation. It looked neat and easy to read but there was nothing to make anyone *want* to read it.

The proper length of an advertisement is a question not so easily settled as one might think. It is a logical assertion that short copy which says something, so arranged as to attract attention and be easily legible, is better than lengthy copy, however well prepared. Yet many readers assert that, if the price, name of the car and evident idea of the advertisement catch them, they are almost sure to read it all the way through, even though it be rather long.

There seem to be limitations, however, to the extent to which increasing the *size* increases the efficiency of a newspaper advertisement. In comparing the impression made by a full-page and a half-page, both equally well done, the persons we asked all maintained that the full-page was surely not worth twice the half-page and some asserted that it was not worth any more.

The average person does not *read* automobile advertising until he has become previously interested in the car that is being featured. This is not saying that he does not *see* it, for he does, nor that it does not impress him, but he does not *read* it until his interest has been previously aroused. Then he reads it for the arguments and that is when good copy counts.

Advertising, therefore, has two functions: To gain the interest of the disinterested public, and to sell the car to those who have already become interested. It is usually too much to expect one advertisement to accomplish both functions with the same reader. Some advertisements, by their attention value, may help to build up interest among unacquainted readers and by their copy may be good selling arguments to those whose interest has already been developed. It is not unlikely, however, that two kinds of copy are needed, one to interest and the other to sell.

Good Headlines Essential

Some of today's copy grasps the headline idea rather well. "Just See What You Get! List the Features on Your Fingers." You know that advertisement says something. You will read it, provided the price is not beyond your reach and you have no previously conceived aversion to the car.

"More Cars Shake Themselves to Pieces Than Ever Wear Out."

There is an assertion that arouses reader interest and the explanation that follows in this particular advertisement is one that most people would read all the way through.

> "ONE of the reasons national automobile campaigns, particularly in newspapers, often lack effectiveness is the very fact that they are national and more especially that they **look** national. They lack personality and local interest.
>
> "Why do we not have the reply coupon in automobile advertisements today? Is it a matter of dignity? If so, what about the question of results?
>
> "In some respects we seem to have forgotten that the purpose of advertising is to create sales. We have ceased to ask our advertising to get us prospects."

"310 Per Cent Increase in Sales!" There is news and a good heading.

"Quick Action Brakes. Extra Large and Extra Safe." This also is good, although in this case the ensuing copy could have been more concise and logical.

There is more need to be specific in the text than in the heading. Probably no automobile exists about which its advertiser has not said, "We believe the ——— to be the best car of its class in the world." Yet this headline (recently used) could be capitalized to advantage. The very boldness of the assertion might attract attention to the explanation that should follow, but in the case in mind the value was entirely lost because the text was too general and illogical.

Specific Statements Needed

A heading may sometimes be general but it should never be mediocre or weak. One company, introducing a new feature, ran eight large advertisements which undoubtedly attracted a great deal of favorable attention, but it suffered one relapse when it said in a headline: "A Four That Is More Than a Four!"

Another headline weakness, lack of coordination between heading and text, is flagrantly illustrated by a half-page inserted recently by one of the largest selling cars in America. In the introduction the company says in large display type, "Avoiding the superlatives frequently used in automobile advertisements," it "desires faithfully to state the facts," etc. *"Avoiding the superlatives"* is a most commendable principle, but look at these selections from the copy which follows:

"The *greatest* intrinsic values."

"Of the *highest* grade, comparable to the *best.*"

"It is one of the *most satisfactory* and *finest* cars on the market."

"The *greatest* value and the *closest* approach to mechanical perfection."

"Second to none in the industry."

"The *highest* principles."

"*Not excelled* * * * by *any* cars * * *."

"*Magnificent* examples * * *."

The writer of this advertisement must have forgotten what he said in the beginning about superlatives. Of course, this is no criticism of the car itself.

It seems as though automobile advertising is too often written according to rule. Too seldom does the writer realize the true importance of the problem presented by every individual piece of copy. The amount of money spent in preparation is almost never enough to justify

the tremendous expenditure for publication. Automobile advertising, to make the progress it should, must break away from the mediocre copy.

Careful study brings the conviction that much of the acknowledged weakness of automobile copy can be laid at the door of carelessness. Too little time, money and real effort is expended in the preparation of each individual advertisement. The frequency with which the advertisements appear has put their production onto a quantity basis, with a consequent depreciation in their quality, and the tremendous quantity of this advertising has caused even those who write it to undervalue its importance.

We must have better copy and to do so we must put more into it. Why not put enough time, effort and expenditure into a single advertisement to make it worth running several times? A news editor would not think of printing the same news item on several different days, because he makes the logical assumption that everyone who is interested has read it the first time it caught his eye. The advertising writer, however, cannot logically believe that everyone he wants to have read his copy does so the first time he sees it, nor can he expect that the second piece of copy is more likely to catch the reader if the first has been passed by. Because different insertions give a *chance* to change the copy is a fallacious argument for doing so.

Consistent Advertising Effective

The busy man who passes a string of billboards for the first time is not greatly impressed by what they say. But if he passes the same boards, day after day, it is inevitable that he will sooner or later become familiar with a large portion of their copy. So it is with daily or weekly advertising in newspapers and other periodicals. The reader may not stop to peruse an advertisement the first time it comes to his attention. Even if he does pause a moment over it he may pass on and forget most of what it was trying to say. But after he has seen it four or five times—if it is at all forceful—we may take it for granted that he knows what is in it and if we spend as much for one advertisement to run five times as we would ordinarily spend on five individual one-time advertisements it ought to be worth reading and remembering.

It is not necessary to tell our whole story in one piece of copy. Seldom, if ever, does a single advertisement sell a car. Before a man even thinks he is in a position to buy an automobile, he has spent hour after hour speculating on how it would seem to own one. He has developed a preference for some car or cars based, not on individual advertisements that told the whole story, but on the accumulated effect of many advertisements, none of which was ever remembered more than in a very small part.

Inspirational Copy Rare

If advertising is to be scientifically and carefully done we must try to elevate it above the plane of hack writing. It is unfortunate, perhaps, that advertising copy is almost invariably written to order and the chance for spontaneous expression, such as has given us masterpieces of literature and art, capitulates to schedules and publication dates. Nevertheless something of literary inspiration is occasionally found in a copy writer and his copy is always better in the same degree that it is the product of enthusiasm rather than of necessity.

Efficient advertising is not altogether dependent upon an ability to recognize what is good; campaigns would be much better if we were more willing than we are to acknowledge what is poor. The fact that money is spent on a campaign does not mean, *a priori*, that a good campaign will result. Too many times the fact that a fair expenditure has been made on the preparation of a piece of copy sends it to the printer when it should go to the boiler room. Much poor advertising is used today because effort and expense has gone into it.

One of the reasons national automobile campaigns, in newspapers in particular, often lack effectiveness is the very fact that they are national and more especially that they *look* national. They lack personality.

Advertisements Should Get Prospects

Why do we not have the reply coupon in automobile advertisements today? Is it a question of dignity? If so, what about the question of results? In some respects we seem to have forgotten that the purpose of advertising is to create sales. We have ceased to ask our advertising to get us prospects.

The testimonial idea, too, has long been considered old-fashioned. There have been some attempts, recently, to revive it, and when we get away from generalities back to concrete facts we shall doubtless see more of it.

Almost every automobile has from ten to twenty essential selling points. New copy should be written around these points to the exclusion of everything else and they should be played up from so many different angles that the public will know them as well as it knows the traffic regulations—or better. If you can get the public to know—not simply to be aware of, but to *know* so familiarily that they always associate them with the mention of your name—fifteen points of superiority about your car you need worry but little whether they ever learn anything else about it except when a new model appears or a new superiority has been developed.

Cruel analysis and severe criticism will always be essential to good advertising. When we think we have learned how to do it is the very time when we are likely to be left behind, for the public mind is always changing; and while it probably is true that the kind of advertising that will be done fifty years from now would probably not sell much merchandise today, it is even more certainly true that the kind of advertising done by most automobile manufacturers today will require considerable improvement in order to be a paying investment in the future.

Trademarks Must Be Registered in Porto Rico

A NEW legislative measure has been passed in Porto Rico along the lines of the United States trademark law.

Under the provisions of this new act American manufacturers must secure protection in Porto Rico of their brands, *independently* of United States registration.

The island of Porto Rico is a possession of the United States, although not an incorporated State or Territory. Therefore, given its special political status and the provisions of its Organic Act, approved by the Congress on March 2, 1917, providing that the Interstate Commerce Act shall not apply to Porto Rico, protection of a trademark is only acquired by registering it under the local statute. This is the prevailing opinion of the attorneys of the island and is concurred in by the Porto Rican patent office and the Division of Foreign Tariffs, U. S. Department of Commerce.

Moreover, some cases of piracy have recently occurred in the island, and therefore American manufacturers should register their trademarks under this new law and have their rights legally protected in Porto Rico. Eighty per cent of the trademarks registered in Porto Rico are by American manufacturers.

Akron Experiment Was Not Fair Test of Bus Transportation Efficiency

Facts of situation are outlined in report issued by N. A. C. C. Certain amount of confusion inevitable because of emergency measures needed. Motor vehicles did demonstrate flexibility.

Varying reports have been circulated of what happened when the City of Akron, Ohio, recently went for 27 days without street car service, the National Automobile Chamber of Commerce states in a report giving its views of the experiment. During this period the city administration attempted to serve Akron's transportation needs with a bus system improvised over night. What the actual results of the experiment were is shown by the following survey of facts.

Disordered methods, with inadequate and inefficient bus equipment, are not capable of motorizing any city's transportation service. Such methods could not succeed in a city of 50,000 population, not to speak of such a city as Akron, four or five times as large. The so-called experiment was an emergency, analogous to emergency methods used to break a strike. Motor buses in themselves did not fail in Akron; the failure was that of a disorganized system of hurry, of nondescript equipment, of a disproportionate fare schedule.

Street car service was suspended in Akron on Feb. 1 because of a disagreement between the city administration and the Northern Ohio Traction & Light Co. over a new franchise and rate schedule. The city adminstration had a "nickel-or-nothing" policy, while the company requested a 7-cent fare with free transfer. Street cars resumed operation Feb. 28 under a compromise providing for a 5-cent fare with penny transfer until Dec. 4, 1924, and a fare of not to exceed 6 cents with free transfers until May 1, 1925, the latter contingent upon an audit of the company's books to be made before Oct. 1.

While this temporary agreement is in force negotiations are continuing for a permanent franchise for the street car company which will be submitted to the voters at the general election Nov. 4. It is possible that a motor bus franchise also will be submitted to the voters at the November election, giving the people their choice between a combined traction-bus contract and an exclusive bus agreement. The N. O. T. operates 24 buses in city service, supplementing the street cars in crosstown and feeder lines service by virtue of free transfers to and from street cars and buses.

Coordination Urged

A great deal of misinformation grew out of the 27 days' war. It was not a fight purely local to Akron, but had a national aspect. In the excitement it was utterly lost to view that the motor bus industry and the electric railway industry both join in the belief that the function of the motor bus and the street car—two distinct agencies of transportation—is to furnish cooperative transportation by means of coordination. The bus and street car have not been, and are not, at war to exterminate each other; complete motorization of a city's transportation service has not been the desire or the hope of the motor vehicle industry.

What has happened in Akron cannot be considered proof of any of the following hypotheses: That the motor bus as an agency of transportation fails to measure up to the street car; that the public prefers street cars because of certain positive advantages; that complete motorization of transportation is impracticable in a city the size of Akron.

Conditions Unfavorable

None of these points was supported by proof because of the confusion attending the sudden suspension of street car service and the over-night efforts of the city administration to induce free lance bus operators from various parts of the country to install bus service. The experiment was tried under the most unfavorable conditions as far as buses were concerned—whether one views the situation as a supporter of complete motorization or with the well-considered viewpoint of the motor vehicle industry which believes in coordination of buses with street cars to improve public service.

Between 100 and 140 buses of every description, seating from 12 to 30 persons each, were put on the streets of Akron. In addition there were 80 small touring cars, which often were loaded with as many as 11 passengers each. The latter carried from 11,000 to 12,000 passengers a day. How many the other buses carried during these 27 days is not known. But all of these vehicles supplanted street cars, which during 1923 carried some 36,000,000 passengers, as well as 24 N. O. T. buses which during that period carried some 4,000,000 passengers, an average of about 110,000 a day.

The chief difficulty was that the city administration could not guarantee to a bus operator any franchise or stated period of operation.

Not even a license could be given or even guaranteed; insurance could not be obtained, and inasmuch as the time was too short to get permits from the Public Utilities Commission there was not only no regulation of these common carriers, but contentions arose that laws were being broken. As a result, responsible bus-operating companies having adequate and up-to-date equipment could not be induced to invade the Akron field. Only those willing to take a chance were attracted to Akron. The response was from the widest variety of free lance operators; their equipment was not regulated in size or type, and much of it was worn out or certainly inadequate.

Organization was completely lacking in the bus system improvised over night in Akron. Yet under this insurmountable handicap, even such buses as were used did demonstrate that the motor bus possesses a flexibility which gives it a distinct advantage in providing service where the rigid conditions of street car operations are a disadvantage.

That is the one thing proved by the Akron experiment: the motor bus is an agency of transportation whose function is to supplement and feed existing street railway lines in complete and sensible coordination with it.

Chevrolet Tarrytown Plant Assembles 600 Complete Cars a Day

Builds, enamels and trims all open bodies required and is adding plant to manufacture closed jobs also. Most operations are performed on continuously moving conveyors. Tunnel baking ovens are employed. Maximum temperature held at about 350 deg. Fahr.

By Herbert Chase

CHASSIS assembling, body building, painting, trimming and final assembly of body to chassis are carried on at a rate of 400 to 600 complete jobs a day at the Tarrytown plant of the Chevrolet Motor Co.

Although only open bodies are built there at present, a new building for closed body construction, to be operated by the Fisher Body Co., is now in process of construction, so that this plant will soon be assembling and painting chassis for all Chevrolet models, as it does today, and also will be building all of the bodies required.

Chassis are assembled on two parallel conveyor lines, each of which consists of a straight, double, assembly chain conveyor some 600 ft. in length. On one side the chassis for open cars are assembled and painted, after which the bodies are attached and inspected, leaving the line as completed vehicles except for correcting minor defects which may be discovered in final inspection.

On the other side of the main conveyor are assembled chassis for receiving closed bodies, but at the present time these bodies are not set on the chassis until after they have left the line and been delivered to another building. The chassis employed for all passenger bodies are identical except for spring construction. Springs for sedan bodies have one more leaf than those used for open bodies.

Operations on Double Conveyor Line

All operations on the double conveyor line are substantially identical up to the point at which the open bodies are attached. Parts and sub-assemblies are fed to these two lines at the points at which they are applied to the main assembly.

The manner in which this is carried out will be apparent by reference to the accompanying diagram. This has been drawn, for the sake of clarity and convenience, in such a way as to indicate that all operations take place on a single level, whereas, in reality, they are done on four different levels.

Main assembly, however, takes place entirely on the ground floor, while open body construction, painting and trimming is done on the second and third floors. Portions of each level are used for storage of parts and materials, and considerable space is allowed in some instances—at the end of the body painting, for example—for storage of units completed by one department which cannot be delivered immediately to the next department.

This provision for temporary storage allows for a certain slack which is necessary, because it is impossible to synchronize exactly the production of all departments. Accumulation of sub-assemblies at given points also helps to avoid shut down of the entire plant in case an accident or other eventuality arises to put one unit behind in its schedule.

In general, materials and sub-assemblies received from outside are unloaded at sidings close to the point at which they enter the assembly line and are delivered by electric trucks to or near these points.

How Power Plant Is Assembled

Chassis assembly starts with the attachment of certain minor units to engine and gearset and the bolting together of these units to form a complete powerplant. These operations are carried out adjacent to and on a short chain conveyor. They include attachment of gearset filler ell, speedometer drive gear, assembly and attachment of universal, mounting of pedals, attachment of carbureter, coil, circuit breaker, plugs, wires, starter switch and cable, brake and shifter lever and filling of gearset and engine with oil.

Air-operated drills are used extensively in these operations for turning up bolts, screws and nuts, and an air hoist on an overhead track is used to raise engines on to the conveyor and off of it on to the test stand, where they are connected to gas, water and electric lines, kicked over by use of starter and allowed to run idle just long enough to adjust valves. This latter operation is performed by two men with standard clearance feeler, screw driver and wrench, while the engine is running. Powerplants are then inspected and carried by air hoist to the end of the main assembly line.

At the same time two separate gangs are assembling frames to go on each of the two main assembly lines and are attaching to them the springs, axles and brake shaft. One gang attaches the heavier springs for closed car chassis and the other the lighter springs for open body chassis.

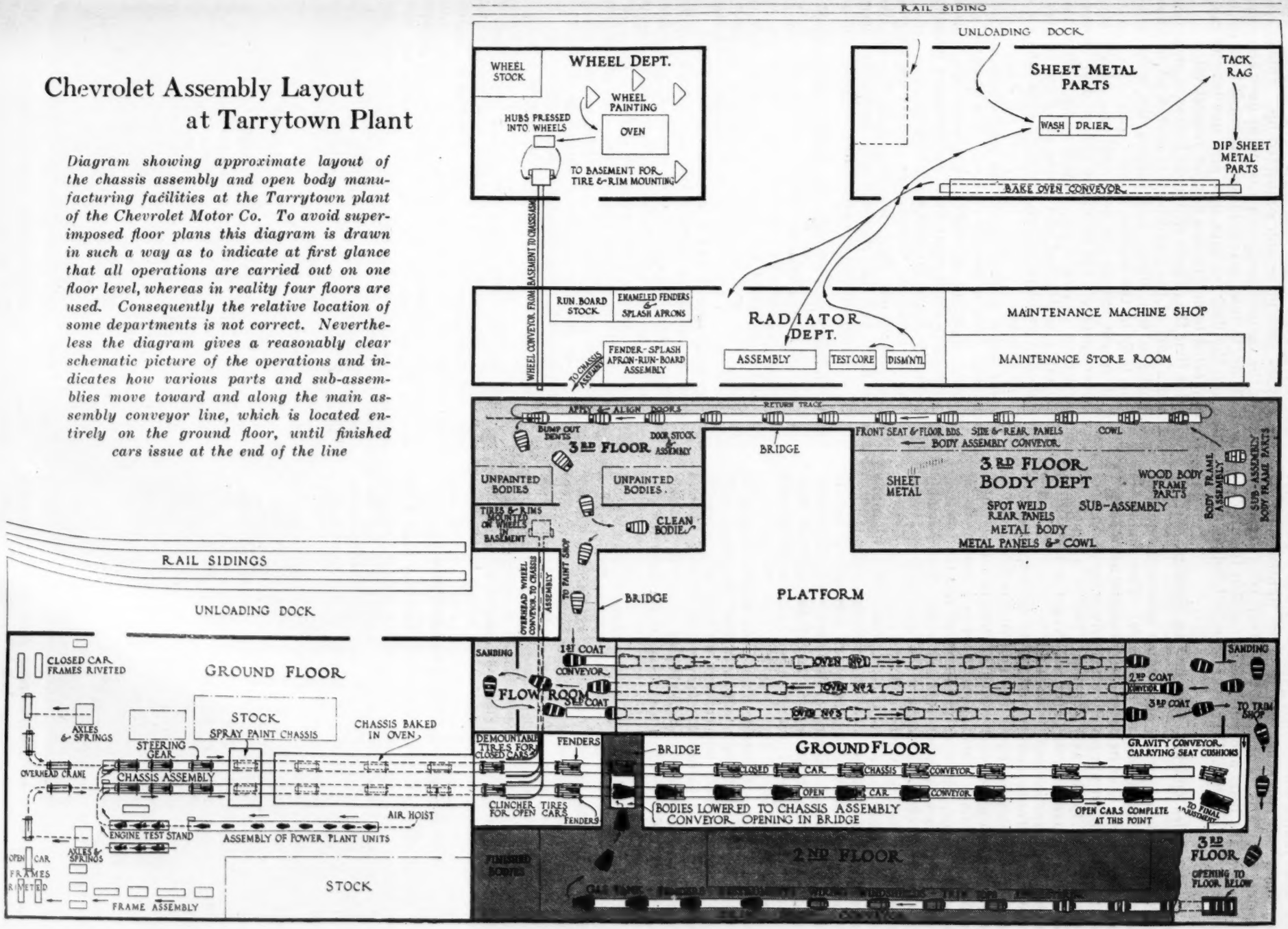
Hot and Cold Rivets Used in Frame

Frames are received with side rails and cross-members pressed to form, cut to length and drilled, but not assembled. Brackets, also ready drilled, are first attached to side rails and cross-members separately by cold riveting after holes are reamed by use of portable drill. This riveting is done with a single blow per rivet under a Bliss press. Step hangers are similarly riveted to side rails, after which rails and cross-members are laid on a table and temporarily assembled by use of hooked drifts inserted by hand.

Thus assembled, the frame is transferred to a hot riveting bench, where a gang of eight men ream all holes and drive home with air hammers the rivets, heated in a small gas furnace. Frames are then slid along by hand

Chevrolet Assembly Layout at Tarrytown Plant

Diagram showing approximate layout of the chassis assembly and open body manufacturing facilities at the Tarrytown plant of the Chevrolet Motor Co. To avoid superimposed floor plans this diagram is drawn in such a way as to indicate at first glance that all operations are carried out on one floor level, whereas in reality four floors are used. Consequently the relative location of some departments is not correct. Nevertheless the diagram gives a reasonably clear schematic picture of the operations and indicates how various parts and sub-assemblies move toward and along the main assembly conveyor line, which is located entirely on the ground floor, until finished cars issue at the end of the line



on metal tables, where other gangs attach front and rear springs. Air wrenches are used to tighten nuts on spring bolts, after which front and rear axles are set in place and the bolts and pins used to attach them to the springs are inserted. The rear axle is handled by air hoist.

Axles Quickly Attached to Springs

No nut is used on the pins which attach the quarter elliptic rear springs to the rear axle. This pin has a circular groove near its outer end, so placed as to receive a smaller tangent pin which, when driven home, anchors the first pin to the axle housing. This is a quick assembly arrangement and also one which is dismantled easily when replacement is required.

When the frame and axle assembly is completed it is raised by an air hoist on a trolley. At the lower end of the hoist is a pulley over which passes the chain which raises the frame. This makes it an easy matter to invert the frame, which up to this point has been bottom up, while it is suspended from the hoist. The assembly is then lowered on to the main conveyor line with axles resting on the two conveyor chains.

As the parallel lines of chassis advance continually at an average of about 6 to 9 ft. per min., various units are added by gangs, each of which performs a certain set of operations. The first of these is to drop the powerplant on to the frame and to insert and tighten holddown bolts. Ratchet and cranked hand wrenches are used in this case.

After this, the following operations are performed in succession: Insert and bolt up steering gear, apply brake rod assembly and connect up rods and retractor springs, bolt on battery box, front fender irons, ground wire, muffler-exhaust-pipe-air-heater assembly, attach drag link and underpan, which has been enameled previously.

This substantially completes the chassis assembly except for steering wheel, road wheels, radiator, and a few small parts which are added later. The chassis now pass through painting booths built over the assembly line. There all parts except the engine receive a coat of spray paint, after which the chassis enter and pass through tunnel drying ovens heated to about 225 deg. Fahr. These ovens are elevated about 8 ft. above the floor and are steam heated.

Wheels Applied After Chassis Painting

As the chassis emerge from the ovens they pass down an incline, near the lower end of which wheels and their bearings are put in place, grease applied and hub caps put on. Step hangers are adjusted with bending iron when necessary. Then the battery is inserted, bolted down and connected to electric system.

Assemblies consisting of run board, front fender and side apron are applied next, and the chassis, which are now running in channel tracks on their own wheels, are ready for the bodies. Open bodies, which have been assembled, painted and trimmed on the second and third floors, as described hereafter, now are lowered from a second floor bridge directly on to the chassis intended for them, while the closed car chassis continue side by side with the open cars to the ends of the two respective lines.

Rear fenders now are bolted to the rear ends of the run boards. Wiring attached to the body is connected to the chassis electric system and head and tail lamps are fastened in place and tested out after connecting wires are attached.

Steering columns are inserted next, steering wheels bolted on, and the column bracket attached to instrument board, after which spark and throttle control rods are slipped into place and connected up. Tubing connecting the vacuum tank, which is on the dash assembled to the body, to inlet manifold and carbureter, is put in place and the dash oil gage pipe and speedometer cable are connected to engine and gearset respectively.

By this time the chassis with open bodies in place have reached a part of the line which is over a pit in which are workmen who insert and tighten the bolts which hold the body to the chassis frame.

Front splash aprons are next applied. At the same time other operators are attaching rubber door bumpers and adjusting doors. Next, radiators and their hose connections are attached and hoods are fitted in place. One gallon of gasoline is then placed in each tank and a filler cap put on.

At this point several inspection operations are performed and certain defects righted. For example, any bare spots or minor scratches on chassis are touched up. Inspectors mark other defects, which are remedied after the cars leave the assembly line.

A pair of cushions, received via chute from the trim shop on the second floor, are placed in the car, the radiator filled, and the completed open cars driven under their own power off the end of the line.

Body Building and Chassis Assembly Synchronized

While the foregoing operations on chassis are in progress, simultaneous synchronized operations on body and other parts are proceeding in other parts of the plant. The most important of these are the assembly, painting and trimming of open bodies which take place on their second and third floors of the plant.

All wood and metal parts which go to make up the body frame and shell are received ready cut and formed to size. These parts are delivered to the third floor of one building, where body assembly takes place. The wood frame of the body is put together first in the form of several subassemblies. One of these is the assembly of the sill to three pillars, two at each side of the front door opening and one at the front of the rear door. To this is added a rail to complete the side of the front seat.

These wooden parts are glued and screwed together in a simple jig, and to them are added scuff plates on the sills and metal brackets which are screwed to the forward pillars of the front doors.

The second subassembly, also put together in a simple wooden jig, consists of the top rail, uprights and slats forming the back of the rear seat. This is glued and screwed together.

A third subassembly is that composed of the heel board and side members of the front seat base, also glued and screwed together. The rear seat base forms a fourth and the heel board and rear pillars of rear doors a fifth subassembly.

Body Subassemblies Put Together in Buck

All of the subassemblies are delivered to main body assembly bucks, one of which is shown in an accompanying photograph, where the entire wood frame of the body is assembled. A right and left sill assembly are first placed in the buck, after which the rear pillars of the rear doors and the rear heel board are assembled to them. The front seat base assembly is then screwed in place and to this is added a stringer, forming the rear edge of the front seat, and a metal plate forming the under bottom of the front seat. The latter is tacked in place.

The next operation in the main assembly jib is to apply the framework which supports the rear panel of

the body, and to connect this at the top by attaching the two rails which form the upper side members of the rear seat. The rear end of these rails is screwed to the top rail of the rear panel while the forward ends are mortised into the upper ends of the rear pillars of the rear doors. Next the rear seat frame is put in place and attached to adjacent members. This practically completes the wood frame of the body except for the floor boards and one or two other parts which are added on the assembly line.

Four main assembly bucks are employed and two men work at each buck. They are provided with electric drills for drilling screw holes, Yankee screw drivers, glue pot and some small C-clamps. Time required for making the main body frame assembly is about 7½ min. When completed the frame is placed on a light wheel truck which is delivered to the end of the body assembly conveyor.

This conveyor is a single chain which runs practically the full length of the building and returns with empty trucks to the end of the conveyor line adjacent to the main assembly bucks.

While the assembly of the body frame is in progress some four or five men are engaged in assembling the metal dash to the one-piece metal cowl by the use of tubular rivets, and in spot welding the three-piece back and quarter panel assembly along vertical seams. This same crew assemble the instrument board to the cowl and deliver this assembly to a point near the end of the body assembly conveyor. An emery wheel is used to smooth the surface of the sheet metal panels and the spot welded joints.

First Operations on Body Conveyor

On the body assembly conveyor the first operation is to apply the cowl to the wood frame and tack it in place. The cowl is located by drifts which pass through the metal brackets attached to the upper ends of the forward pillars of the front doors. When located, this panel is held in place by C-clamps while it is being tacked to the pillars. Immediately following this, the rear panel is applied in similar fashion, as are also the small side panels between front and rear doors.

Next, lock plates are screwed in place, the rear tire carrier is attached and the top rail is drilled at the rear corners. Then metal brackets, to which top irons are attached, are screwed to the rail.

Floor boards are next screwed to the body sills and an extra slat is tacked to the uprights of the rear panel. In succeeding operations screws holding the instrument board to the cowl bracket are inserted and the cushion ledge for the front seat, which is another subassembly, is put in place. Following this, the metal back for the front seat is tacked in and the remainder of the front seat back is inserted and fastened to adjacent members. The final operation in this part of the body assembly line is to tack to the forward edge of the front seat a strip of metal for retaining the cushion.

Doors Assembled and Attached

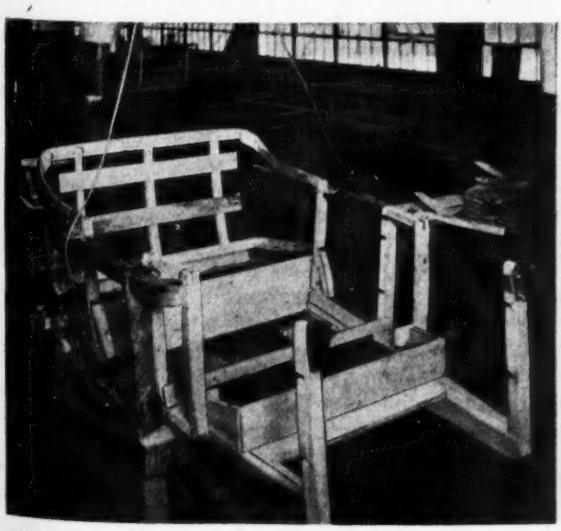
All of the body assembly operations are carried out while the conveyor is in continuous motion. As will be seen from the accompanying diagram, the body assembly conveyor extends through a passageway after leaving the main body assembly department and enters a room in an adjoining building, where the doors are assembled and attached to the body.

Door frames are of wood and are received completely assembled from an outside source. The first operation on them is to apply the concealed hinges. This is done while the door frame is held in a jig. A small electric drill is used for making screw holes and the screws are driven home with Yankee screw drivers. The lock is screwed to the door frame in similar fashion after the door has been passed across a bench and locked in a second jig.

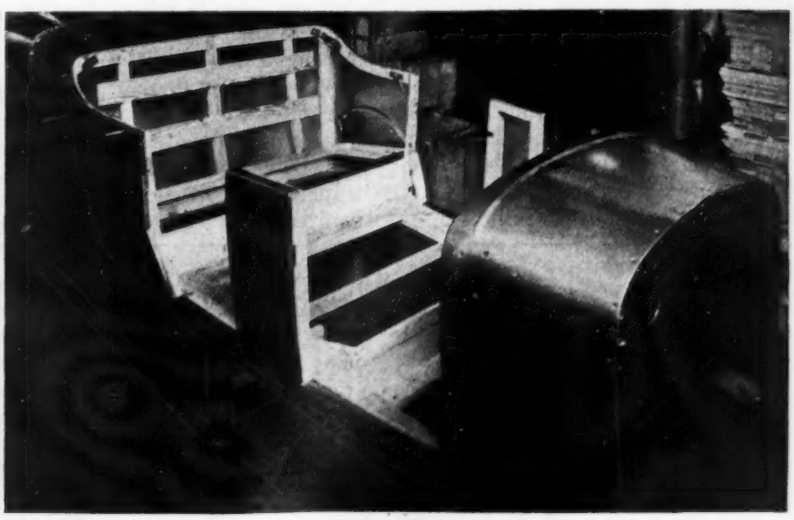
During the next operation, which consists of tacking the metal door panel to the door frame, the parts are held in proper relation by a special quick-acting jig. While in this jig, the sockets for rubber bumpers are also tacked in place. Cement coated nails are used wherever metal is tacked to the wood frame. Doors next are passed to a drill press, where the upper edge is drilled to receive an aluminum curtain iron socket, which is driven into place.

Doors now are ready to be hung and are delivered to the body assembly conveyor, where the door pillars are drilled for hinge screws and the doors are hung and adjusted. A gang of six to eight men is employed in door hanging and adjusting operations along this part of the conveyor.

A drill jig is next applied to the upper edge of the body and an electric drill is used to make holes for curtain button screws. Cap screws for holding rear fenders in place are next inserted, after which the body passes to the end of the conveyor line, where all dents in panels



Wood frame of Chevrolet phaeton body in the main assembly buck, ready for transfer to the body assembly conveyor shown in background



Chevrolet phaeton body with all metal panels except that forming back of front seat in place. This body is almost ready for hanging of doors

are bumped out. This completes the assembly of the body proper and it is trucked to a cleaning room, where the surfaces to be enameled are wiped off with cloths wet with volatile gasoline. Exposed portions of the body interior next are slushed with black paint, after which the body is ready for its first coat of enamel. This phaeton body contains 121 lb. of wood and 125 lb. of metal.

Bodies are delivered to the flow room on trucks, from which they are rolled on to the end of the conveyor, which carries them over the enameling stands and through the tunnel baking ovens. Enamel is flowed on to the panels from a hose fed from a pump. During this operation the body is passing over tanks, into which the surplus enamel drains, and is recirculated. The flow room is fed with washed air at such a rate as to maintain in the room at a pressure slightly above atmosphere, thus preventing the entrance of dust from adjoining rooms and keeping the atmosphere free from oven fumes. After the enamel is flowed on, the body passes over drip pans before entering the first baking oven.

Bodies Baked in Three Tunnel Ovens

Baking is done in a series of three ovens, placed side by side at about floor level and measuring 220 ft. in length. Ovens are heated by oil fired hot air heaters and are, of course, provided with the usual means for preventing fire and extinguishing it in case it occurs.

The first oven in the battery is heated to about 315 deg. Fahr. Bodies issuing from the exit end are placed on hand trucks for inspection and any rubbing of imperfections that may be required. They are then given a second coat of enamel and are fed through the second oven of the battery, whence they return to the flow room at the other end of the battery. Here they are again inspected and any imperfections are rubbed, following which a third coat of enamel is applied, and the body passes through the third oven in the battery. In the second oven the temperature is maintained at about 315 deg. Fahr. and in the third at about 325 deg. Fahr. Total time in ovens is about 4 hr.

At the end of the third oven bodies are loaded on hand trucks, inspected and delivered through a passageway to an adjoining building, where they are lowered by air hoist directly on to the conveyor in the trim department on the floor below. Here the first operation is to fasten the tire carrier bracket to the rear panel of the body. Cards covering side and rear panels of seats next are inserted and wadding, cut to proper size, is put in place.

Strips of paper are next placed over the upper edges of the doors, after which the ready prepared inner door panels are tacked in place. In this operation the paper covering for the door upper edges is caught under the panels, where it remains as the body progresses through the shop. It serves to protect the upper edge of the door from scratching, which might result otherwise.

Upholstery Materials Cut to Size

All upholstery materials are delivered to the trimming department cut to proper size and ready for application. The trimming material which covers the sides and back of the seats is already plaited and stuffed. It is put in place and tacked along the bottom edge before the back springs are inserted under the wadding. After the springs are inserted the upholstery is tacked around the upper edges of the seats, trimmed off, and the tacks covered by a strip of Hidem, which also is tacked in place. This completes the upholstery work, but the body continues along the same line for other operations.

The next of these is application of the windshield, which is bolted through the cowl. Nuts are tightened by use of a special chuck and socket wrench used on an electric drill. A similar device is used for applying curtain buttons. The rear curtain is applied next and is fastened with wood screws, after which the upper edges of the seats are touched up with black dye intended to cover any exposed ends of the jute wadding which protrude from under the upholstery.

Folding Tops Applied and Trimmed

Ready formed top bows are prepared for use in a bay beside the conveyor line. They are first shaped at the ends to fit into the enameled bow sockets and are covered by lengths of fabric tubing especially made for this purpose. After the tubing is slipped over, the bows are driven into the bow sockets while the latter are held in a jig. The top bows now are ready for attachment to the body. When this has been done, the next operation is to tack on a wind break above the windshield. Rear top straps then are tightened against standard distance pieces and are tacked to the rearmost bow. Next the wadding for the top, with its cambric covering and the webbing which supports the top, are tacked in place.

Immediately following this the upper edge of the rear curtain is tacked to the bow, after which the covering material of the top is stretched and tacked in place and the tacks covered by a Hidem strip. This completes the trimming operations, but several items of equipment are added to the body before it leaves the trim shop conveyor.

Of these, the first are the rear fenders, which are attached with cap screws already inserted in the body. Nuts are tightened with a cranked hand wrench. A wiring harness next is applied, after which all instruments, including speedometer, oil gage and ammeter, and such parts as cowl light, switches and horn, are applied. Following this a hood lacing is inserted and a G & G vacuum tank is attached to the front side of the dash. A gasoline tank then is bolted up to the underside of the body at the rear and connected to the vacuum tank by a length of copper tubing.

Bodies Reach Chassis Conveyor

This completes the body assembly. Bodies are run off the conveyor line on hand trucks to a bridge, from which they are lowered by an air hoist on to the chassis frame, which, as described above, is proceeding along the main assembly line.

All trimming materials used in the body are delivered to cutting tables or presses on the second floor of the building. Here they are cut to desired shape and passed directly to women operators, who perform the necessary stitching and stuffing operations. This department is arranged to minimize handling. It is provided with machines for applying covering to the seat cushion springs and fastening same with a metal binding strip.

As will be seen by reference to the diagram of the production layout, there are various subassemblies carried out in parts of the plant not referred to above. These include wheels, which are received with priming coat only, are put through a spray painting process, dried and supplied with bearings, rims and tires in a separate department. Most of this work is carried out on the main floor, but after rim bolts and bearings are inserted the wheels are loaded on to conveyors, where they pass to the basement of the building. Here tires are placed on the rims and the rims on the wheels with tires ready inflated. Thereafter complete wheels, with tires and rim in place, are fed to another conveyor, which delivers them to the main assembly line, where they are applied

to the chassis. Inasmuch as clincher tires and rims are used on open models, and demountable rims with straight side tires on closed models, two separate sets of wheel conveyors are employed, each feeding respectively its main conveyor line.

All sheet metal parts not attached to the body frame during the assembly of the body are received in a special department adjacent to the unloading docks. Here they are inspected and delivered to a machine in which they are thoroughly washed in a commercial fluid prepared for the purpose, rinsed and baked at 450 deg. Fahr. to insure evaporation of all water. They then are ragged by hand to remove water stains and are delivered to the feeding end of a special enameling conveyor on which they are dipped and passed through enameling ovens.

From the delivery end of these ovens the sheet metal parts are delivered to various points where they are required in assembly. For example, radiator shells go to radiator assembly, rear fenders to trim shop assembly line, front fenders and splash aprons to run board assembly, hoods to hood assembly, underpan to chassis assembly, and various small parts to main assembly line, etc.

When originally received, radiator cores are assembled in the shells. The latter are removed for cleaning and enameling and then are reassembled to the core, which first has been tested for leaks before the radiator is delivered to the main assembly line.

Another subassembly of importance is that which includes the run board, with its linoleum cover and moldings, the splash apron and the front fender. The board and linoleum arrive at the department where this assembly is made cut to size. The covering is glued in place, after which moldings are tacked on and the fender and splash aprons are fastened to the board. This assembly then is delivered to the main assembly line only a few feet distant.

It should be borne in mind that the buildings used in the plant here described were not designed for the particular production system employed, but that the system had to be adapted to the plant. For this reason some features are necessarily different than they would be if the plant had been laid out and built especially for the scheme of production now employed. Nevertheless, the whole assembly scheme is well worked out and there is a notable lack of confusion and very little unnecessary handling of materials.

Beach Carbureter Is Constant Vacuum Type

A CARBURETER of the variable venturi or constant vacuum type has been placed on the market recently by the Beach Converter Corp., Belleville, N. J. It has a wood float located in a float chamber concentric with the mixing chamber and makes use of a float valve consisting of a ball of Tobin bronze.

The structural part of the carbureter comprises two aluminum castings, one forming the float chamber and the lower part of the air passage, the other the float chamber cover and the throttle chamber. The instrument is made in both horizontal and vertical outlet types, and so far has been sold for replacement purposes exclusively. The air inlet at the bottom of the float chamber forms an L and contains a choke valve to facilitate starting.

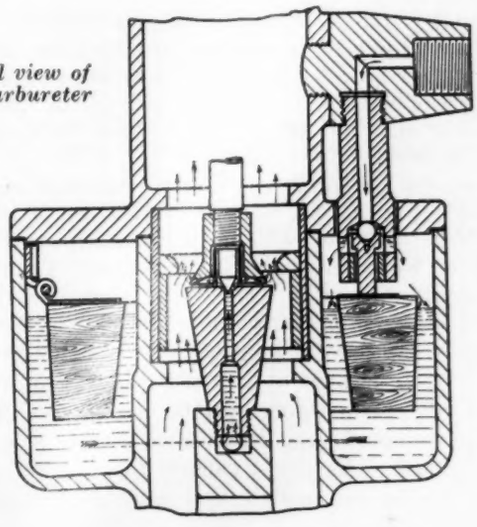
Gasoline enters at an L fitting secured to the throttle chamber above the float chamber and passes down through a nipple at the bottom of which there is a seat for a ball valve. This valve is actuated from the wooden float directly through a short valve holder bearing against a metal insert in the top of the float. The float is hinged to the float chamber on the opposite side, and the comparatively large distance between the hinge axis and the valve holder axis is a factor in reducing the friction between float and valve holder and in making the valve very sensitive to changes in fuel level.

The use of a ball valve at this point is claimed to overcome difficulty in preventing leakage of fuel. Owing to the spherical form of the valve and its seat it is not necessary that the valve holder axis should coincide with the valve seat axis. The wood used for the float is a special Southern hardwood known as tupelo and is rendered impervious to the fuel and to any water which it may contain by first giving it a coating of glue and while the glue is still hot dipping it in formaldehyde.

The venturi air passage is formed by giving the part serving as spray nozzle an inverted truncated form. The spray nozzle opening is adjustable by means of a conical valve extending through the top of the carbureter. After leaving the metering orifice the fuel flows through radial passages until it meets the stream of air coming up from below at the most constricted part of the air passage. The outer surface of the venturi is formed by a floating sleeve with an inward flange run out to a sharp edge at its upper end.

At starting the sleeve rests on a ledge within the carbureter body and the cross sectional area of the air passage at the delivery openings of the spray nozzle is very small. As the engine speed and the throttle opening increase, however, the sleeve is raised by the increased suction and the depression at the section where air and fuel mix remains nearly constant. Constancy of suction naturally makes for constancy of mixture proportion. The fact that where the fuel and air mix, their directions of flow are substantially at right angles to each other tends to produce effective atomization and a thorough intermingling of the two.

Among the claims made for this carbureter is that the fuel level in the float chamber cannot vary more than 1/64 in. and that in consequence the metering is very close. There is only one adjustment, that of the fuel valve. Excellent fuel economy and increased flexibility are said to have been obtained.



Sectional view of Beach carbureter

Motor Trunk Highways Needed to Care for Future Traffic

Proposal to build roads around outskirts of congested areas approved by engineers at S.A.E. Metropolitan Section meeting. New Jersey plans are outlined.

NEED for motor trunk lines, circling around congested city centers, to take care of future car and truck traffic was shown clearly at a meeting of the Metropolitan Section of the S. A. E. on Thursday, March 13. The subject was crystallized by Major William G. Sloan in his paper which outlined specific plans for a motor trunk highway to be built in New Jersey, the beginning of which is to be at the entrance to the new vehicular tunnel at Jersey City.

Various speakers pointed out that traffic congestion has come to be an important factor in slowing up automobile sales and that future development in many areas will depend upon the construction of trunk line highways capable of carrying through traffic around the outskirts of cities. Such roads would fit in admirably with the movement to coordinate rail and motor truck hauling by establishing freight terminals in outlying areas and distributing l.c.l. freight from those terminals by motor truck.

M. W. Wier said that roads should be built for the purpose of directing population and preventing congestion rather than be delayed until the presence of an urban center demanded highways.

Balloon Tires Easy on Roads

S. P. Thacher, in a letter sent to the meeting, said that cushion tires and other automotive design developments will result in less wear and tear on the road, while A. J. Scaife outlined the success which several railroads are having in using trucks for short haul l.c.l. traffic.

F. C. Horner presented a brief résumé of the work accomplished in coordination of various kinds of transportation agencies by committees appointed by the U. S. Chamber of Commerce.

Col. F. S. Greene, Highway Commissioner of New York, told of some of the political difficulties met with in putting over an adequate road program in New York and disagreed with Major Sloan as regards the width and building material proposed for the vehicular tunnel parkway in Jersey City.

Practical use of traffic studies and economic studies in determining the location, type and character of highways was outlined by Major William G. Sloan, State Highway Engineer of New Jersey, in his paper on "Trunk Highway Motor Transport." "The essential consideration in connection with motor trunk highways," Major Sloan said, "is that they shall so far as possible lie outside towns and cities and be so located as to reach existing or potential industrial centers." Using specific examples of work accomplished in New Jersey, he showed how properly graded and constructed roads pay dividends in the form of lower fuel consumption per vehicle and how the cost of traffic studies is more than made up in the economies resulting from them.

Part of Major Sloan's talk follows:

Railroad Experience Useful

The development of the motor industry has created a situation as regards our highways which involves them in the same problem which the railroad companies are endeavoring to solve, and the experience of the railroad companies may be well used to advantage by those who are working out our highway problems. As a matter of fact, the two mediums of transportation are closely related and fast becoming more so.

Railroad companies are realizing the fact that much of their short haul business can be more economically handled by motor trucks over the highways and that this can be accomplished with greater convenience to the consumer.

The development of the motor vehicle industry, together with such improvements of highways as have been made have resulted in a very great increase in property values. These values will not increase further and in all probability will become decreased unless adequate highway facilities are furnished.

A further interesting example of the effect of the improvement of highways on values is afforded by the increase in value of rural lands. A tabulation of land values would show a more or less definite correlation of their values with the distance from improved highways, which is due, of course, entirely to the degree of accessibility of these lands to the community centres.

Assuming that adequate highway facilities will be provided, it is interesting to speculate as to what the probable future traffic on these highways will be, both as regards character and amount.

Predicting Future Traffic

A survey of motor vehicle ownership throughout the country shows that in certain of our Middle Western States there has been licensed one car for approximately every five people, and the curve representing such ownership over a number of years past would seem to indicate that it would flatten out at approximately one automobile for every four persons within the next ten or fifteen years. It is also possible to project population curves and particularly where considerable areas are involved this can be done with reasonable accuracy. The relation between the number of automobiles licensed in any particular area and the traffic in that area from observations made in the State of New Jersey, would seem to be that the traffic count varies somewhere between the half-power and the first-power of the number of licensed vehicles.

In the State of New Jersey, on certain highway problems which have recently had a great amount of study, this basis of figuring lead to the conclusion that the traffic in 1937, approximately 14 years in the future, would be 2.7 times the present volume, and it was considered that the proportionate increase of truck traffic would be greater than that of the pleasure car.

Traffic Studies Utilized

The traffic studies which I have just mentioned were made in connection with proposed plans for the relief of congestion at the two ends of our State Highway route between Jersey City and Camden, a route heavily congested at the present time and largely so by motor truck traffic. The plans were made at this time with a view to relieving the further congestion which would occur on the opening of the vehicular tunnel between New York and Jersey City on the northerly end, and the opening of the bridge over the Delaware River between Philadelphia and Camden on the southerly end, both of which structures, it is contemplated, will be complete and in operation in the year 1926. The proposed improvement leading from the entrance of the vehicular tunnel would extend for a distance of 13 miles from the tunnel entrance to a point beyond the City of Elizabeth, where connection would be afforded with the existing State Highway routes. The maximum hour count of traffic to be expected over this 13 miles of highway was taken at 5500 vehicles.

Due consideration was given all the elements involved in the economics of highway construction in the design of this work. Gradients and curvature were adjusted so as to permit the safe operation of motor trucks without the necessity of changing gear, and the highway was carried around the congested portions of Newark and Elizabeth that its purpose as a through highway might be served and its efficiency not impaired by the presence of strictly local traffic.

Grade Crossings Eliminated

In addition to the very vital advantages gained by the elimination of all grade crossings there was effected a saving in total rise and fall of some twenty feet. The fuel saving effected thereby on the large volume of traffic that will be handled by the highway was found to be sufficient when capitalized to pay for the cost of the construction.

The essential consideration in connection with motor trunk highways is that they shall, so far as possible, lie outside towns and cities and be so located as to reach existing or potential industrial centres.

A further consideration in connection with such highways is their relation to the railroads, for, as previously stated, they are properly taking the place of the railroads for short-haul distribution.

It is conceivable that the railroads will find it to their advantage to construct yards and terminals in the vicinity of the larger centres of population, from which a very large tonnage will be moved by motor trucks direct to its ultimate destination. The question of whether the operation of such motor truck distributing systems should be absorbed and become a part of the railroad operation or whether it should be handled by others is one which should be of vital interest to motor truck producers, and one to which you should give thought and consideration before the railroads have absorbed the business.

However and by whomever this distribution actually may be effected, the point remains that in the location of our motor truck highways due consideration should be given to the fact that the condition will probably exist.

Highways are constructed with public funds and it is to a considerable extent lack of such funds that has placed highway construction throughout the country in such a disadvantageous position with respect to the increase in the number of motor vehicles which use the highways. The past few years have, however, seen a marked improvement on the part of the counties, States and the Federal Government toward providing funds for this most essential and vital purpose.

Many of the states have authorized bond issues, the proceeds of which are to be devoted to this work, and likewise in most of the States the receipts from motor vehicle licenses and other sources of revenue, in connection therewith are being set aside for this purpose. At the present time the Federal Government is appropriating to the States approximately $65,000,000 per year to assist them in carrying out their highway program.

In the aggregate these funds look large, but considering the total mileage of highway over which they must be distributed they are entirely inadequate and, in comparison with the amounts of money being paid by the taxpayer for motor vehicles and the operation thereof, they are very small.

Objects of Road Design

The object sought in design and construction of highways is to secure a structure which shall be the shortest practicable consistent with economy between the points to be reached, which shall have only such gradients and curvature as permit economical operation and which shall present a hard, smooth and durable surface for vehicular travel.

Obviously, due to the variable and changing conditions of the soil on which such a structure must be founded, its design does not lend itself to a scientific analysis, and in my opinion proper design of highways will be largely determined by experience rather than by any strictly engineering calculation. I do not mean that the very valuable information resulting from the tests which have been conducted and the research work which has been carried out by several of the States and by the Federal Government should be ignored, but rather that these results should have our careful thought and study and be used in connection with the information gained from careful observation of the several types of pavement which we are now constructing, as developed in their actual use.

At the same time that we are giving our careful thought and study to the proper design and construction of our highways as regards their durability we must not lose sight of the principles of economics which present themselves in connection with their operation.

Operating Costs Estimated

I do not know that there have ever been prepared figures showing the estimated cost of operating the motor vehicles of this country, but I believe that a conservative figure for the two essential items of gasoline and tires alone probably would be not less than two and one-half billions of dollars; certainly a sum sufficiently large to justify our every effort toward effecting improvements which would tend toward a saving in these operating costs.

Improvement in the character of the paved surface produces a marked effect in this direction, it having been demonstrated by actual test that the fuel consumption is approximately 25 per cent less for a motor vehicle traveling over a concrete surfaced road than for one traveling over an unimproved road. I am of the opinion that the percentage of saving as regards wear and tear on vehicle and tires would be as much, if not more.

Continuously Variable Transmission Developed in America

Weiss invention has driving member in form of hemispherical shell within which is body known as a mutor. Latter unit is of ring, wheel, or disc form and rotates about its own axis on anti-friction bearing. Stops car on hill without use of brakes.

MOST of the development work in the automobile field during the past fifteen years has been concentrated on the engine, and as a result the rotative speed, the power output per unit of displacement, the flexibility and other factors have attained to values which would have been considered impossible at the beginning of this period. Considerable attention has been given recently, however, to other components. Great interest was shown in American automobile circles some time ago when it became known that several European inventors were working on variable transmission gears which not only would permit of a continuous variation of the transmission ratio but also would effect this variation automatically in accordance with the resistance to motion encountered by the driving wheels.

In a recent article on European automatic transmissions we mentioned that considerable work along the same line had been done in this country in earlier years, and we have learned since of a continuously variable transmission developed here which involves features different from any that had come to our attention before. It is the invention of Carl W. Weiss of the Weiss Engineering Association, New York, who for a long time was engaged in the manufacture of oil engines in this city. Mr. Weiss has worked out his invention in several different forms, all embodying the same basic features; also he has had models made of some of these forms and had one transmission built and installed in a Dodge car.

The particular form of Weiss transmission described here may not be the form most suitable for automobile purposes, but it seems to be best adapted to explain the features of the invention by.

All of the different designs comprise a driving member in the form of a substantially hemispherical shell. In the design illustrated in Fig. 1 on the left the member comprises more than one-half of a spherical shell, but in some of the designs it is truly hemispherical. Within this shell there is a body known as a mutor which is of ring, wheel or disc form and is adapted to rotate around its axis on an anti-friction bearing. The axis of this mutor intersects the axis of the shaft of the driving member at the center of the hemisphere, but the angle between the two axes can be varied by suitable mechanism.

The mutor carries on its circumference a series of ball bearings which are mounted on studs projecting a short distance from each side of the inner race of the bearing. Each projection of the stud rests on a spool-shaped roller, the ends of the spools being supported on cam-shaped surfaces formed on the mutor, as illustrated in the detail view.

Method of Operation

Referring again to the general view, it will be seen that as the driving shaft revolves, the point where the ball bearing contacts on the hemispherical shell describes a circle around the axis of the driving shaft. When the axis of the mutor is at right angles to the axis of the driving shaft the diameter of this circle is zero, but as the mutor is swung around from this position it increases

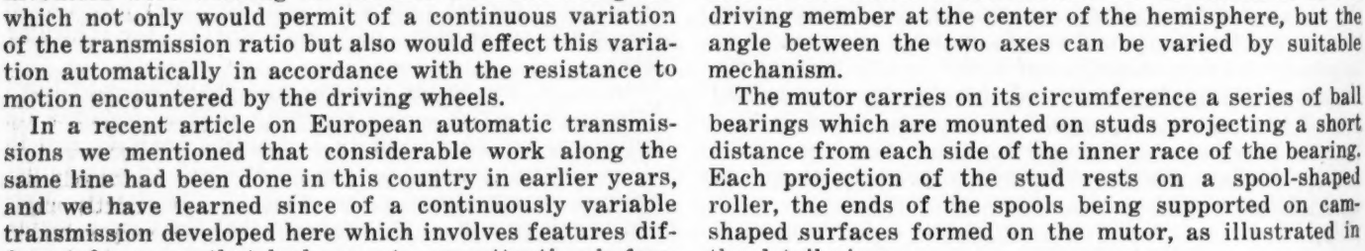


Fig. 1—Two forms of Weiss continuously variable transmission, with detail view of annular ball bearing on roller mounting

until it attains a maximum value when the mutor axis coincides with the driving shaft axis. In practice, owing to interference of parts, this latter position is not always attainable.

Firm driving contact between the hemispherical shell and the outer race of the ball bearing is established by the ball bearing being slid in the direction of its axis on the rollers in the mutor, which results in a wedging action similiar to that taking place in a ball or roller ratchet. In some respects the conditions of the drive are not unlike those in a friction disc and wheel combination, with which a continuous variation of the transmission ratio is also obtainable. Differences, however, arise because in this case the contact is metal-to-metal, because there are as many lines (or surfaces) of contact as there are ball bearings, instead of a single one, and because the transmission ratio can be varied without interrupting the drive.

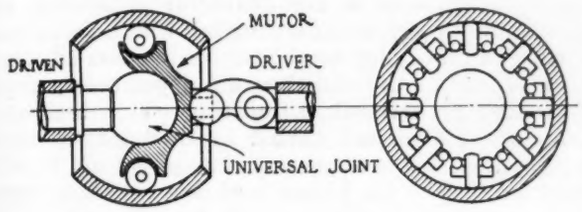


Fig. 2—Heavy duty type of Weiss transmission

At the instant of contact a point in the circumference of the ball bearing and a point in the driving shell move at the same speed in the same direction. A point in the driving shell can move only in a plane perpendicular to its driving shaft axis. A point in the circumference of the ball bearing, on the other hand, can move around two axes at right angles to each other, viz., the axis of the ball bearing and the axis of the mutor. If the axis of the mutor coincides with the axis of the driving shell, then the mutor will be carried along with the driving shell and there will be no rotation of the ball bearings around their own axes. If the axis of the mutor is at right angles to the axis of the driving shaft the ball bearing contacts with what may be called the pole of the hemispherical driving shell and no motion will be transmitted.

In any intermediate position of the mutor relative to the driving shell the motion imparted to a point in the circumference in the ball bearing will be partly rotation around the axis of the ball bearing and partly rotation around the axis of the mutor. With the inclination of the mutor axis to the driving shaft axis the rotation of the mutor around its axis per revolution of the driving shaft changes and the ratio of transmission changes.

Mutor Is Double Bevel Gear Ring

In the design here shown the mutor comprises a double bevel gear ring mounted on a ball bearing on a carrier. This bevel gear ring meshes with two bevel pinions on a shaft having bearings in the carrier. The angle between the axis of the driving shaft and the axis of the mutor is varied by rotating the carrier around its axis, which is done by means of a pair of bevel gears. From the shaft the power can be transmitted in any desired way, a pair of bevel gears being shown in the drawing.

One advantage of the Weiss gear is that the tangential force which must be transmitted from the driving shell to the mutor is comparatively small, owing to the high speed of the points of contact. With this gear it is possible to bring the car to a stop on a hill and hold it without applying the brakes and without shutting down the engine.

A design which probably is better adapted to motor car work than that described above, is that shown on the right in Fig. 1. Here the mutor is swung directly around its axis and motion is transmitted from the mutor to a driven shaft through a pair of angle gears with teeth so designed that the conditions of mesh are not seriously affected when the angle between gear axes is changed. The forward end of the driven shaft is carried in a bearing that has a pivot connection with the bearing support for the driving member of the pair of angle gears, the pivot axis being tangent to the two median pitch circles. It will be noticed that the whole mechanism is inclosed and of such a shape that it can be readily mounted on an automobile chassis.

The form shown at the right in Fig. 1 as applied to motor cars is directly reversible by moving the mutor about 8 deg. (the practical limit) beyond the neutral position, in which it is shown in the illustration. The speed ratio is then equal to the size of the angle of the mutor.

A form suitable for industrial locomotives has been designed to run in either direction of rotation to the full speed limit, the driven shaft being placed at right angles to the driving shaft. The heavy duty type illustrated by the sketch, Fig. 2, is best suited for transmitting high power under severe conditions.

Hand Machine Changed to Semi-Automatic

AN attachment for converting their No. OY Plain Milling Machine from a hand-operated to a semi-automatic machine, thereby adapting it to rapid production work, has been developed by the Brown & Sharpe Mfg. Co. The attachment is simple and can be applied readily.

The table feed hand crank is replaced by a pulley about which is wrapped a web belt extending down to a treadle. Depressing the treadle rotates the pulley and moves the table to a position where the cutting feed is engaged. This same operation also compresses a heavy spring, and upon completion of the cut a trip dog disengages the cutting feed and the spring automatically returns the table to the loading position.

It is claimed for the attachment that it reduces the hand movements required from five to two and the non-cutting time by 50 per cent, by a fast advance and return of the work to and from the cutter; that it leaves both of the operator's hands free to adjust the work and that it makes it impossible to jam the work into the cutter. If the loading time is shorter than the cutting time, two machines can be run, the table return being automatic.

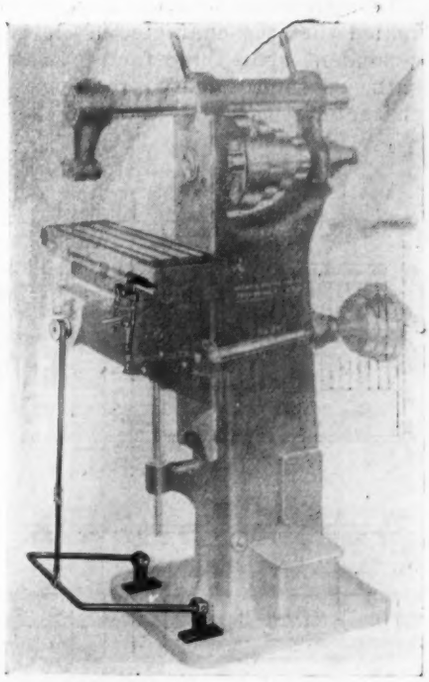


Table attachment for Brown & Sharpe No. OY plain milling machine, making same semi-automatic

Quality of Nickel Finish is Improved by Packard Researches

Changes in equipment and methods have resulted in a coating of increased depth and greater hardness. Steel radiator shell replaces brass type formerly used. Spray tests are favorable. Immersion time, current and strength of bath determine quality.

A NICKEL finish of greatly improved quality, increased depth and somewhat greater hardness is produced as the result of research work which has been devoted to equipment and methods for this class of production by the Packard Motor Car Co. Tests in salt spray have demonstrated that the finished product of the new process is far superior to that turned out by the older and more conventional nickel plating process. In fact, the new process has proved so satisfactory that this company no longer uses a brass shell for the radiator of the single-eight model and is now using a steel shell.

Formerly brass was regarded as being the more satisfactory base for nickel-plated finish. At the same time considerable trouble was experienced in forming the sharp corners that are characteristic of all Packard radiators. The brass blank was liable to split at these corners and necessitated brazing which in turn complicated the preparation prior to plating and in occasional instances resulted in slight pinholes in the finish and consequent rejection. Steel can be drawn to the required form in a very satisfactory manner and, with the new process, can be plated with full assurance of equal if not superior finished quality.

Investigation by the metallurgical department revealed that the character of electrolytic nickel finish is dependent upon three factors, time of immersion in the bath, current density or amperage and the chemical characteristics or strength of the bath. These factors, naturally, are based on the character of anodes which must be practically the pure metal which is to be deposited. In the older methods, a low current density had to be used or the nickel would deposit very roughly and produce an oatmeal-like coating which took an unsatisfactory polish and varied in thickness. Formerly this company used a current of 4 amp. per sq. ft. of immersed surface to be plated and any increase immediately was followed by the result just described. This sequence led to a careful study of the chemistry of the bath or solution.

New Solution Adopted

This investigation ultimately led to the adoption of an electrolytic solution of greater concentration. At present the ammonium-nickel-sulphate solution in the nickel-plating bath carries 4.85 oz. of nickel per gal. Although a double salt is used, the nickel content is the determining element and consequently the solution is analyzed at least once each week to insure the continuance of this ratio of contents. If any deterioration is indicated by the analysis, enough additional salts contained in cloth bags are added to restore the desired proportion of nickel.

When the bath is maintained in this manner, a current density of 10 amp. per sq. ft. produces a rapid, even transfer of nickel from the anodes to the immersed parts. In common with other electro-plating processes, the potential is maintained at 4 to 6 volts. As the time of immersion has not been reduced, Packard metallurgists maintain that the amount of nickel deposited by the new process is about 2½ times that with the former method. Due to the increased density of the current and the greater concentration of the bath, the deposition is much harder than formerly and consequently more durable.

A salt spray test was utilized to check the results of the two methods and in every case pieces nickeled by the new process have shown better wearing qualities than anything produced by the older process. In this test, the radiator shell or any other desired part is placed in a closed cabinet and subjected to a blast or spray of 20 per cent solution of ordinary salt and water. The liquid, which is maintained at room temperature, is contained in the bottom of the cabinet

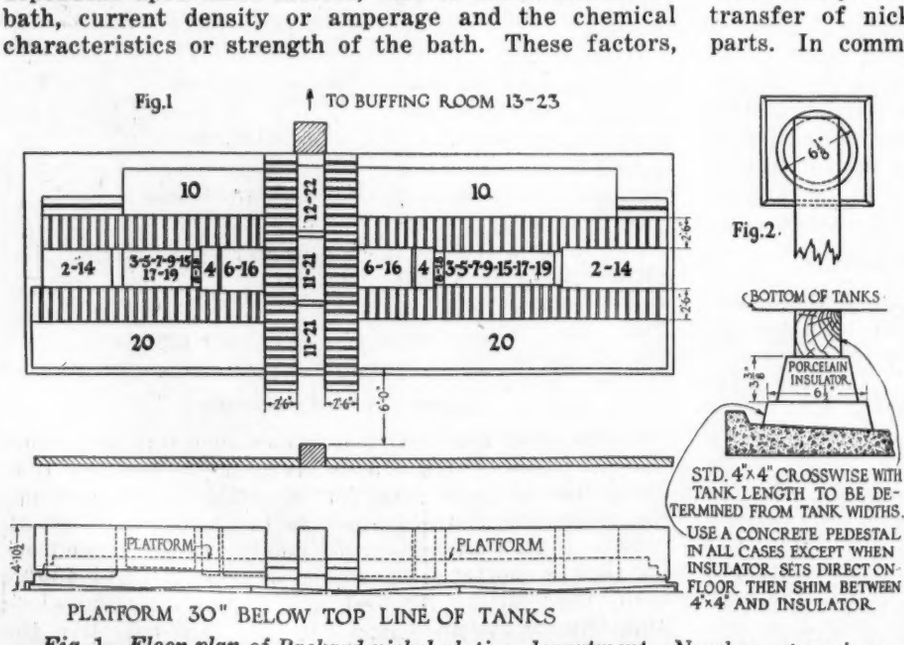


Fig.2.
BOTTOM OF TANKS
PORCELAIN INSULATOR
STD. 4"×4" CROSSWISE WITH TANK. LENGTH TO BE DETERMINED FROM TANK WIDTHS.
USE A CONCRETE PEDESTAL IN ALL CASES EXCEPT WHEN INSULATOR SETS DIRECT ON FLOOR. THEN SHIM BETWEEN 4"×4" AND INSULATOR.

Fig. 1—Floor plan of Packard nickel-plating department. Numbers at various tanks indicate sequence of operations performed at each position
Fig. 2—Details of pedestal mounting and porcelain insulators

and is picked up by powerful fans and forced against the surfaces to be tested. The spray forms a dense fog which tends to penetrate any defect in the nickeled surface and attack the steel base. Defects are indicated by the presence of rust at the end of the test. If the piece is properly plated, polishing restores the finish to its original bright luster. When using the apparatus as described, the effects of from two to three years service in the field are approximated in a twenty-four-hour test.

An excellent check of the characteristics of the new finish as compared to the old is brought out by the monthly expenditure for corrective labor in reworking defective nickel-plating on radiator shells. This figure has been reduced from $100 to $12 per month and the reduction is attributed very largely to savings in the buffing room. As the former plating was soft and varied in thickness, the buffing operation often penetrated the coating, exposing the bare steel underneath, and necessitated reworking. Since the new process has been in operation, the resultant expense has been reduced by 88 per cent.

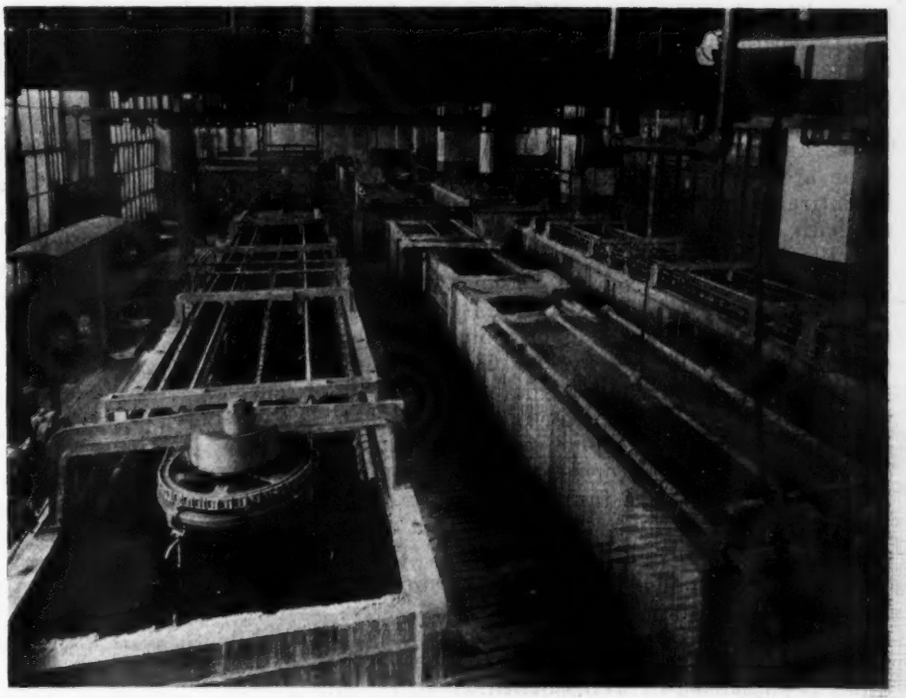


Fig. 3—Packard nickel-plating department. Note typical conveyor construction at radiator nickel bath in left foreground. At left is Wyandotte cleaner tank and bus bars are shown above. Finish water tanks extend between the switchboards in the middle ground. Buffing room is at extreme left

Analogous to the developments in the nickel bath and current density, the preliminary copper-plating operation has been improved by similar treatment. Where the current density was formerly 5 amp. per sq. ft. of immersed surface, 12 amp. now are being used. The copper cyanide electrolytic solution now carries 5.1 oz. of copper cyanide and 6.5 oz. of sodium cyanide per gal. This content is also maintained by weekly analysis and recharging.

Copper Plating Theory Developed

Packard metallurgists have developed a rather interesting theory covering the necessity for copper plating prior to nickel plating. Nickel can be deposited on steel by the electrolytic method but the result rarely is satisfactory in the commercial sense. The trouble is attributed to the fact that no matter how well the surface of the steel has been polished minute waves remain. Nickel when deposited follows the contours of these waves and later is buffed thin or even penetrated at some of the peaks. Consequently rusting begins readily and in extending, undermines the nickel coating and sets up flaking or peeling of the plating with all of the aspects of an unsatisfactory job. When the steel part is copper-plated first, this coating is soft and flows readily during the intermediate buffing process. The minute hollows between the peaks of the waves are thus filled so that the nickel is deposited in a coat of uniform thickness which buffs evenly over the entire surface.

As the radiator shell is representative of the most difficult nickel-plating operation, the progress of this part from the press on through the entire process will be described. Preparation prior to the electro-plating operations is a most important factor in the production of a high grade finish. The surface must be in as smooth condition as can be obtained by modern polishing methods and then must be thoroughly clean or defects are bound to appear in the ultimate finish.

The routine which is followed in this plant is as follows:

1. Polish.
2. Clean by immersion in Wyandotte Cleaning Fluid.
3. Wash off in cold water.
4. Dip in 20 per cent muriatic acid solution.
5. Dip in cold water.
6. Dip in potassium-cyanide solution.
7. Dip in cold water.
8. Bench brush with pumice and water using platers brush.
9. Dip in cold water.
10. Copper-plate in copper-cyanide solution. Time of immersion, 30 min.
11. Dip in cold water.
12. Dip in hot water to accelerate drying.
13. Buff.
14. Dip in Wyandotte cleaning solution.
15. Dip in cold water.
16. Dip in potassium-cyanide solution.
17. Dip in cold water.
18. Bench brush corners at radiator water inlet.
19. Dip in cold water.
20. Nickel-plate in ammonium-nickel-sulphate solution. Time of immersion, 55 min.
21. Dip in cold water.
22. Dip in hot water to accelerate drying.
23. Buff.

Sequence of Operations

Polishing before plating is sub-divided into five separate operations. Cloth wheels are used for the first four and a felt wheel is used for the fifth. In the first operation the shell is rough polished on a dry wheel which is impregnated with 70-grade emery. In the second operation the polishing is crossed or done at right angles to the lines left by the first, again using a similar cloth wheel but 120-grade emery. In the third operation the wheel is impregnated with 150-grade emery and frequent applications of a tallow stick are made. The direction of polishing is again crossed during this oper-

ation. The same process and equipment are used for the fourth operation when the polishing marks are again crossed. For the final operation a felt wheel and 150-grade emery are used, tallow being applied and the polishing crossed. At this point the shell has a bright luster and is exceedingly smooth. Great care must be taken at every stage to prevent scratches as they must be entirely obliterated before the shell goes to the plating bath.

Following the polishing process the shells enter what approximates a line routine. The new department has been arranged to facilitate rapid handling and thus prevent the possibility of dirt accumulation between operations. As indicated by the floor plan, Fig. 1, the right half of the layout is devoted to radiator shells while the left is given over to operations on miscellaneous parts with a common row of water tanks at the center. Elevated platforms of slatted construction extend around all of the tanks with the exception of the two extreme ends. The slatted construction is indicated on the layout.

All tanks with the exception of those containing the Wyandotte cleaning fluid are made of wood and are pitch lined. As potash is the base of the cleaning fluid, steel tanks are used in these two places. Each of the tanks is supported by 4-in. square wooden beams placed crosswise, which in turn are supported at their ends on porcelain insulators that rest on concrete pedestals. The tops of all tanks are approximately 5 ft. above the floor level and the slatted platform is 2 ft. 6 in. high. The concrete floor is banked up around all sides and drains toward the center as shown by Fig. 2, which also includes details of the insulator arrangement.

Tank Number Indicates Operation

In Fig. 1 each tank is numbered to indicate the operation performed at that point, numbers being based upon the previous list of operations. The four electro-plating tanks are located in the corners. The copper plating tanks which are located at the top of Fig. 1 are somewhat smaller than the nickel-plating tanks as the required time period per operation is just over half of that of nickeling.

Parts are fed in from each end to the rows of tanks which are located between the plating tanks of each half. In order these are first, Wyandotte cleaner tank; second, cold water tank; third, a small bench; fourth, muriatic solution tank, and fifth, potassium cyanide solution tank. The final washing tanks for both hot and cold water lie in the vertical center line of the figure, the hot water tank being adjacent to the door of the buffing room.

Overhead Bars Conduct Current

Current is conducted to the electrolytic tanks by overhead bus bars which are heavy rectangular section copper. Each of the four tanks is equipped with an endless chain conveyor system running over sprockets which have their axes in the vertical plane. The chain merely actuates the carriers which are equipped with copper bearing surfaces that slide on a copper bus bar. The chain is located just above the bus bars which are joined by a semi-circular section at each end, the radius of which is identical with that of the sprocket just above. Anodes are carried on three longitudinal copper tubes, one at the center and one at each side wall, which are supported in insulated brackets. Commercially pure bar nickel and copper anodes are suspended in their respective baths by hooks.

Switchboards are placed on the two columns which are in the center line of the room. As the amperage must be varied to suit the amount of work in the bath, a system of progressive knife switches is used to control this factor according to the reading of the adjacent ammeter. Voltmeters are also placed on each switchboard.

Casual examination of the routine of operations will reveal that provisions for cleanliness are the outstanding features. Without this feature, high grade nickel-plating is impossible. One unusual test for cleanliness is in use in this department. As the shell or other part is raised out of the water bath at the ends operations 9 and 19, it is held in the air for a moment and the condition of the water film is observed. If this film is unbroken and the water drains off smoothly, the part is perfectly clean. If, however, the film breaks at any point and leaves what appears to be a dry spot, grease is present at that point and the part must be rerouted through the preliminary cleaning operations.

THE Utility Mfg. and Sales Corp. of Boston have brought out an improved license plate frame and holder, which is adjustable to all sizes of license plates and requires no bolts or screws to hold it. It is made of German silver and nickel plated, and its object is to improve the appearance of license plate and of the car.

Balloon Tires Standard on New Reo Phaeton

Balloon tires, 6.20/20 in. size, are standard equipment on a new Reo model, the T-6 special phaeton, which has just been announced by the Reo Motor Car Co., Lansing, Mich. Disk wheels with demountable rims are used. This model is priced at $1,595 f.o.b. factory. Two options are offered in color, blue or deep gray, with either gray Spanish leather or standard black leather upholstery. Included in the equipment are windshield wings, Moto-Meter and bar cap, drum type head and cowl lamps, the former with nickeled balls, a cigar lighter and an electric clock

United States Produces 85 Per Cent. of World's Tire Output

Total number of casings built was 54,520,000 in 1923. Exports from leading manufacturing countries estimated at 4,638,000. French are chief competitors. Battle for business is keen.

By E. G. Holt
Rubber Division, U. S. Department of Commerce

DURING 1923 the production of casings for motor cars and motorcycles in the principal tire manufacturing countries of the world reached an estimated total of 54,520,000, of which the United States produced about 46,000,000 or 85 per cent.

Total exports of automobile and motorcycle casings from the leading tire manufacturing countries is estimated at 4,638,000 in 1923, compared with 3,961,000 in 1922. United States exports of automobile casings numbered 1,325,753 in 1922, and increased to 1,362,741 in 1923, but the percentage of the total export trade supplied by the United States declined from 33.5 per cent in 1922 to 29.4 per cent in 1923.

Although the United States did this very creditable share of the export tire trade of the world in 1923, the number of automobile casings shipped abroad was only about 3 per cent of the tire production of the country. The answer lies in the fact that there are more than 13,200,000 passenger automobiles in the United States, while all the rest of the world has about 2,280,000.

As contrasted with the American tire industry foreign manufacturers are estimated to have produced 8,520,000 casings for motor cars and motorcycles during 1923 and to have exported 3,275,000 or 38 per cent of them.

French Depend on Export Sales

France was dependent on export markets for the disposal of 50 per cent of her production; Italy nearly 75 per cent; Great Britain 21.5 per cent; Germany 36 per cent; and Canada 28.6 per cent. In view of the fact that foreign manufacturers are using every effort to retain a trade which means so much to them, tire prices in some export markets have been reduced to levels even below those in the United States. When it is considered that American manufacturers have to meet the low prices of competitors in export markets and in addition have often to pay greater transportation charges and heavier customs duties than competitors in shipping to the best markets, it is surprising that the American exports constituted so large a portion of the world export trade as they did.

French manufacturers are the chief competitors of Americans in the export tire trade. They supplied approximately 30 per cent of the total volume of exports in 1923, with shipments of about 1,400,000 casings. The dominating firm in the French export trade, Michelin & Cie., exports from both its home factory in Clermont-Ferrand and its Italian factory at Turin. American manufacturers export both from their United States and Canadian factories. Italian and French tire exports combined were about equal in volume to those of United States and Canada. These four countries together accounted for 80 per cent of the export tire business in 1923.

The following table gives carefully prepared estimates for exports, production, and production capacity in 1923, for the principal tire manufacturing countries outside the United States. Estimates of tire exports during 1922 from each country are also shown.

Exports, Production and Production Capacity of Casings for Motor Cars and Motorcycles, Estimated for Principal Foreign Manufacturing Countries

	1922 Exports Number	1923 Exports Number	1923 Actual Production Number	1923 Production Capacity Number
France	1,125,000	1,400,000	2,800,000	3,500,000
Italy	345,000	450,000	650,000	850,000
Canada	375,000	500,000	1,750,000	2,500,000
Great Britain	343,000	430,000	2,000,000	3,500,000
Germany	192,000	250,000	700,000	1,200,000
Japan	160,000	130,000	200,000	250,000
Belgium	36,000	75,000	120,000	225,000
Australia	35,000	25,000	250,000	400,000
Austria	24,000	15,000	50,000	75,000
Total—Foreign.	2,635,000	3,275,000	8,520,000	12,500,000
United States...	1,326,000	1,363,000	46,000,000	.....
Total for World	3,961,000	4,638,000	54,520,000	.....

French, Italian, Canadian, German, British, and Belgian exports all increased notably in 1923 as compared with 1922; Australian, Japanese, and Austrian shipments decreased. The number of automobile casings exported from the United States in 1922 was officially reported as 1,325,753 and as 1,362,741 in 1923; thus there was a slight increase in the American trade during 1923, although American shipments were made from Canadian branch factories to an increasing extent. This trend is likely to continue.

Official trade statistics show exports of automobile casings from Germany in 1922 as 191,642, and 251,767 in 1923. The United Kingdom is officially reported to have exported 270,721 casings for motor cars and 72,481 casings for motorcycles in 1922. For Great Britain in 1923, and for other countries except Germany in both 1922 and 1923, the estimates of exports are based on official statistics either of weight or value, which are available for most of the countries.

While it is intended to show the relative activity of the tire industries in the various countries rather than the actual production capacity, it is believed that the estimates are conservative, and that the production capacity of foreign tire manufacturers would total at least 12,500,000 tires per year.

New Substance for Coating Cylinder Walls Said to Promote Fuel Economy

Locomobile adopts process called kataliting which is claimed to accelerate combustion and thus render more efficient the conversion of thermal to mechanical energy. Test results given.

A GOOD deal of work has been done in recent years to find means for influencing the combustion of the fuel within the cylinders of internal combustion engines. One aim has been to prevent or retard detonation or pinking, and another to render the conversion of the heat energy of the fuel into mechanical energy more efficient, as, for instance, by increasing the rate of flame propagation.

The Locomobile Company of America, Inc., has recently adopted a method of coating the wall of the combustion chamber in the cylinder head with a substance capable of acting as a catalyst, whereby, it is claimed, important gains with respect to fuel economy and freedom from detonation are obtained. The process employed is known as kataliting and was developed by Dr. Edward Sokal of the Katalite Corp., New York. Both the present T-head engine and a new engine, which has an offset dome type of combustion head, developed by the Locomobile company, will be regularly treated by this process in the future.

In applying the treatment, the combustion chamber surface within the cylinder head is first sand-blasted to remove the scale, and is then further cleansed with carbon tetra chloride, to remove any traces of grease that may be present on it. It is then given a brush-coating of a silicate suspension in water, which is allowed to dry. The silicate forms a very adhesive coating, and is applied to insure the proper adhesion of the catalyst to the combustion chamber wall. The catalyst (a cerium salt) is mixed with a certain proportion of the silicate and the mixture, suspended in water, is applied with a brush, after which the cylinder head is baked at 400 deg. Fahr. for a certain period.

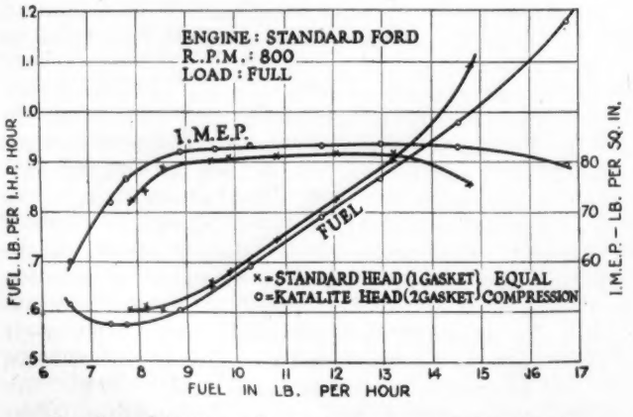
It is Dr Sokal's theory that the Katalite, by acting catalytically on the elements of the fuel mixture, accelerates the combustion and thereby renders the conversion of thermal into mechanical energy more efficient. Ever since the process was first announced engineers have regarded it with a good deal of skepticism. One argument against it has been that, in order to prevent knocking or detonation, it has been found expedient in some cases to resort to the use of materials which tend to *retard* the rate of combustion or flame propagation—the so-called anti-knocks or anti-detonators, which have been referred to on occasion as anti-catalytic agents. A combustion accelerator naturally would be expected to have an exactly opposite effect. Another argument is that, since the chemical combination of the fuel with the oxygen of the air takes place in and close to a surface known as the wave front, only a part of the edge of which can be in contact with the combustion chamber wall surface, it is hard to see how the catalytic agent can have much effect on the rate of combustion.

Catalytic Processes Used in Chemical Industry

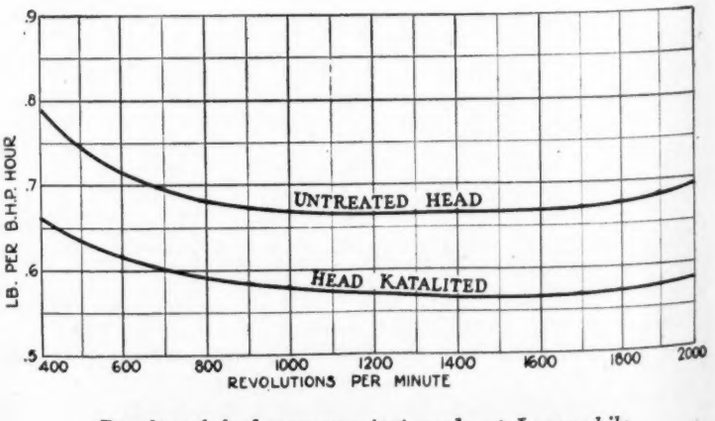
It is true that catalytic processes are used to a considerable extent in the chemical industry at the present time, notably in the production of ammonia from atmospheric air. It has also been found possible to accelerate the conversion of heavier into lighter hydrocarbons by hydrogenation by means of catalysts. But most of the chemical reactions which are thus influenced are endothermic reactions, in which heat energy is absorbed, and which naturally take place at a slow rate, whereas the combination of hydrocarbon fuel with air is exothermic and naturally takes place at a very rapid rate.

In deciding to adopt the Kataliting process in its regular production, the Locomobile company was guided mainly by the results of road tests. These were conducted partly on a test hill near Bridgeport known as Sport Hill, and partly over a 46.6 mile course, including both country roads of various kinds and city streets, the tests on the hill being for power and acceleration and the tests on the longer course for fuel economy.

As an example of the results obtained in the hill tests the following may be cited: With the standard head,



Results of tests made at the Bureau of Standards on a Ford engine with the stock head and with a "katalited" head



Results of fuel economy test made at Locomobile Laboratory on engine with offset dome type of head both with and without Katalite

on a dual valve T-head engine, starting at the foot of the hill at 15 m.p.h., the mile mark was passed after 1 min. 42 sec. at a speed of 53 m.p.h., while the top of the hill (1 1/3 miles) was passed at a speed of 61 m.p.h. With the same engine but with Katalited heads the mile mark was passed after 1 min. 32 2/5 sec. at a speed of 58 m.p.h. and at the top of the hill the speed was 68 m.p.h. In this test no change was made in the carbureter setting.

In one of the comparative economy tests held over the 46.6 mile course the following results were obtained: With the stock head, when the course was covered at an average speed of 29.5 m.p.h. the fuel consumption was at the rate of 1 gal. per 9.2 miles, while with the katalited head at an average speed of 30.3 m.p.h. the fuel consumption was 1 gal. per 10.5 miles. In this case, however, the carbureter setting was changed, the low speed jet being changed from No. 55 to No. 56 drill size and the main jet from No. 49 to No. 50 drill size.

Greater Efficiency Claimed

It might be suggested that this change in carbureter adjustment or setting in itself might have brought about the increase in fuel economy, but this argument is disposed of by Delmar G. Roos, chief engineer of the Locomobile company, by stating that with the leaner setting it was impossible to operate the engine when fitted with the ordinary head.

Mr. Roos contends that the advantage of Katalite resides in the fact that it permits of "leaning" the fuel mixture more than is practicable with the ordinary head. That Katalite accelerates the combustion, he says, is shown by the fact that less spark advance will give the same results with the katalited head. He further mentions that with the standard Locomobile T-head engine, which has a compression volume equal to 23 per cent of the total volume at the beginning of the compression stroke, it is impossible to operate under full throttle with one set of spark plugs cut out. (Two-point ignition is regularly used in this engine). The engine will lose a great deal of power and knock intolerably, while with the katalited head the loss of power will be slight, and although there is still some pinking, the operation is commercially passable.

Dynamometer Tests Made

Dynamometer tests also have been made by the Locomobile company on a new design of six-cylinder L-head engine with offset dome type combustion head. No increase in power was obtained with the katalited head with the same carbureter setting, but it was found possible to reduce the fuel flow materially without loss in power and with increase in fuel economy. A sample of the curves obtained in these tests is shown herewith. It will be seen that the minimum fuel consumption with the ordinary head is about 0.66 lb. p. hp.-h. and with the katalited head, 0.56 lb. p. hp.-h.

Not quite such favorable results were obtained by the Bureau of Standards, which made tests of a Ford engine which had been treated by the process. The best results in this case were obtained in a full throttle run, and these are represented by the graph reproduced herewith. In these tests care was taken to insure that the compression was exactly the same in the engine when using the ordinary and the katalited head, which was found to require a double gasket with the katalited head.

It will be noted that these tests were run under wide open throttle and a constant speed of 800 r.p.m. The carbureter setting was then varied to change the richness of the mixture, and the scale at the bottom of the graph, which shows fuel consumption in pounds per hour, is really a measure of the richness of the mixture. The engine with the katalited head shows a slight advantage throughout the range of mixture richness, both as regards indicated mean effective pressure and fuel consumption. The maximum indicated mean effective pressure with the katalited head was about 83.5 lb. p. sq. in., as against 81.5 lb. p. sq. in. with the stock head, and the minimum specific fuel consumption with the katalited head was about 0.575 lb. p. i. hp.-h., as compared with 0.605 lb. p. i. hp-h. with the stock head.

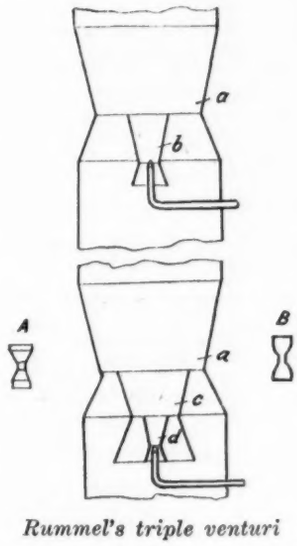
In this connection it is worthy of note that the tests with the stock head extended only over a range in mixture strengths down to that represented by a consumption of 7.8 lb. p. hr., which apparently was the leanest mixture on which the engine would run with this head. With the katalited head the mixture was leaned down further, but this further "leaning," instead of decreasing the fuel consumption, increased it. This, moreover, is in accordance with results of other experimenters, that the maximum thermal efficiency is not obtained with the leanest mixture with which it is possible to run the engine, but with a slightly richer mixture.

History of the Triple Venturi Carbureter

ACCORDING to an article in *Allgemeine Automobil Zeitung*, the originator of the triple venturi for carbureters, which has come into practical use in recent years, was Dr. Kurt Rummel of Aix-la-Chapelle, an investigator to whom we are indebted for a great deal of information regarding the laws of flow of liquids from spray nozzles. Rummel took out German patent No. 190,-916 on Jan. 13, 1907, but allowed it to lapse in 1910. The title of the patent is "Carbureter for Explosion Engines for Liquid Fuels," and the single claim reads substantially as follows:

"A carbureter for explosion motors for liquid fuels characterized by the fact that at the mouth of the nozzle the inner wall of the housing is contracted and within this contraction one or more double funnels are arranged in such relation that the rear end of the funnels in the direction of flow is located at the most restricted section of the funnel next larger in size or of the housing."

The drawing which accompanied Rummel's patent application is reproduced herewith.



Rummel's triple venturi

FOLLOWING is a list of expedients resorted to in order to prevent discharge of the car battery through failure to open the ignition switch after the engine has been "killed." Perhaps the most effective means is the use of a thermostatic switch which automatically opens the circuit after the current has been flowing for a few minutes.

A useful and reliable device is said to be a switch which is closed by the suction on the inlet pipe acting on a diaphragm, the first partial turn of the engine causing the contacts to close. Naturally, when the engine stops the switch opens and renders the circuit dead. These different methods were given in a paper on Electric Starting and Lighting Equipment read before the Institution of Automobile Engineers by A. C. Burgoine recently.

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE
Reg. U. S. Pat. Off.

JULIAN CHASE, Directing Editor — JAMES DALTON, Editor
NORMAN G. SHIDLE, Managing Editor
P. M. HELDT, Engineering Editor — HERBERT CHASE, Engineering Editor
J. E. SCHIPPER, Field Editor — W. L. CARVER, Field Editor
C. G. SINSABAUGH, News Editor
WARREN BAKER, Ass't News Editor — D. M. McDONALD, Detroit News

Home Office, 239 West 39th Street, New York City
Cable Address.....Autoland, New York
Telephone.....PENnsylvania 0080 New York

BRANCH OFFICES
Chicago—5 So. Wabash Ave., Phone Randolph 6960
Detroit—7338 Woodward Ave., Phone Empire 4890
Cleveland—538-540 Guardian Bldg., Phone Main 6432
Philadelphia—56th and Chestnut Sts., Phone Sherwood 1424
Indianapolis—1212 Merchants Bank Bldg., Phone Circle 8426

SUBSCRIPTION RATES
United States, Mexico and U. S. Possessions.....$3.00 per year
Canada ..... 5.00 per year
All Other Countries in Postal Union..... 6.00 per year
Single Copies .....35 cents

Entered as second-class matter January 2, 1903, at the post-office at New York, New York, under the Act of March 3, 1879.

Copyright 1924 by THE CLASS JOURNAL COMPANY

Member of the Audit Bureau of Circulations
Member, Associated Business Papers, Inc.

Automotive Industries—The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

THE CLASS JOURNAL COMPANY
U. P. C. Building, 239 West 39th Street, New York City
HORACE M. SWETLAND, President

C. A. MUSSELMAN, Vice-President and General Manager — A. B. SWETLAND, Vice-President and Manager
E. M. COREY, Treasurer — W. I. RALPH, Vice-President
HARRY TIPPER, Secretary — E. E. HAIGHT, Western Manager

Owned by United Publishers Corporation, 239 West 39th St., New York; H. M. SWETLAND, President; CHARLES G. PHILLIPS, Vice-President; A. C. PEARSON, Treasurer; FRITZ J. FRANK, Secretary.

Muscle Shoals Fight Not Ended

HENRY FORD has won an important victory in the passage by the House of the bill which would give him control of Muscle Shoals but the hardest part of his fight is yet to come in the Senate. There is little likelihood that the measure will be given Senatorial approval at the present session because of determined opposition which will lead to prolonged debate.

Legislation has been sadly delayed by the investigation orgy and the last minute jam before adjournment promises to be even more serious than usual. Adjournment is certain before the Presidential nominating conventions and it is likely that the only bills passed will relate to revenue and appropriations. If the Muscle Shoals measure does come to a vote in the Senate it is quite possible a majority may be found favoring acceptance of the Ford proposal.

Quite apart from what may happen at this session, the odds are strongly in favor of ultimate acceptance of the Ford offer. He has promised that if he is given a chance to develop the water power of the Tennessee he will build on the banks of the river an industrial city which will rival Detroit. The South contends that it is interested in the Ford offer chiefly on this account and that none of the other bids which have been made for Muscle Shoals contemplate such a step. That section of the country is ripe for industrial development and it is not likely to rest content until Mr. Ford is given an opportunity to carry out his plans.

The returns he offers the Government in exchange for a huge power reservoir are held by his opponents to be ridiculously small, but it must not be forgotten that he will be risking his own millions without any assurance of a profit. He is willing to gamble a staggering sum that he will win, but if he does he will be the one who has taken the risk.

Business Omens Still Are Good

THE end of the first quarter of 1924 approaches with no indications of a relapse in business. Certain speculative interests amused themselves for a time by trying to depress the security markets but they met with only temporary success. The country could not be bamboozled into the belief that the goblins were out gunning again.

The outlook is exceedingly bright for another three months at least and there appears now to be no sound reason why it should not continue so for the rest of the year. Notions that Presidential years always have brought depressions are entirely erroneous. Some of the years in which our quadrennial political battles have been contested have been lean but some of them have not. When they have been lean, the economic reasons for it have been much more substantial than they are now.

If any slump is in prospect because of apprehension over the results of the Presidential campaign, it certainly is not in prospect yet. Freight car loadings are going up steadily and are approaching the million-a-week mark. They have established new records for every week thus far this year and they are a much safer barometer of business than the real or professed opinions of stock speculators.

The automotive industry is not seriously extended in any way and production can be curbed almost immediately if there are any untoward events which presage a general business recession. While the outlook is exceedingly encouraging, we should not bury our heads in the sand and refuse to see danger signals if they are hoisted, however. Heavy loss might have been averted in 1921 if the industry had been more fully awake to the situation and had not failed for so many weeks to recognize what was going on.

When a sharp falling off in business does come, this year or next year or some other year, as it will come sooner or later, there is one element of danger to which consideration should be given and which should be planned for in advance.

An enormous volume of retail business is being done on the deferred payment plan. Many thousands of buyers who have bought cars on this basis can meet their notes promptly as long as there is no

shrinkage in their present earning capacity, but if there should be unemployment on a large scale or any material decrease in wages and salaries, a large proportion of them would have to default.

In such an event the finance companies would have to repossess the cars involved. Credit concerns which are doing business on a "no recourse" basis would be the chief sufferers as the dealers assume no responsibility. They also would have to share the losses on all other transactions in this category.

All these repossessed automobiles would be thrown on the market for what they would bring. No imagination is required to see what would happen. Dealers would be unable to sell used cars taken in trades and lacking such an outlet they would find the demand for new products seriously circumscribed.

As long as general business conditions remain as good as they are now the situation holds no menace and the development we have outlined possesses only an academic interest, but when a depression does come that interest will become immediate.

Franc's Fall Serves Good Purpose

NO matter how skillful politicians may be in juggling budgets, taxes and governmental expenditures, they can't stall off indefinitely the working of immutable economic laws. The recent fall of the French franc has afforded a most striking demonstration of this fact.

Ever since the armistice France has based its finances upon the theory that it would recover large reparations from Germany, but its expectations in this respect greatly exceeded the ability or willingness of the Teutons to pay. Regardless of this fact, the Ministry of Finance continued to juggle frantically a huge "invisible budget" which was in reality the difference between receipts and expenditures. While the visible budget might balance there was in the air a large deficit. No amount of legerdemain could cancel it, although it seemed to be the theory that as long as it wasn't admitted it would do no harm.

The present French Government believed that if it took physical possession of the Ruhr it would be able to extract a large revenue from that rich industrial district with which to wipe out that theoretically invisible deficit. The revenue was not forthcoming, however, taxes were not equal to ordinary expenditures, the purchasing power of the franc declined steadily and the cost of living rose.

The decline of the franc became more and more rapid. It may have been stimulated by speculation and propaganda, but economic forces were mainly responsible. The Government became thoroughly alarmed. The only means to prevent the franc from following the course of the mark and the rouble was a large foreign loan with which to stabilize French currency. That loan now has been negotiated with American bankers.

While official information is lacking, it is asserted on high authority that the loan was maded contingent upon acceptance by the French Government of the recommendations of the Dawes Commission, which is working out a solution of the reparations problem. Unpalatable as the dose may be for French politicians, therefore, it is probable that the fall of the franc will force a settlement of the question which has embroiled Europe ever since the war and prevented its stabilization.

The French people are prosperous and it is the only country in Europe which has no unemployment problem, but its Government was brought to the door of bankruptcy because its politicians refused to recognize the force of economic laws. Americans feel a profound sympathy for the French in their efforts to recover from the effects of the war, but sound finance cannot be dictated by the exigencies of politics. It may have been good politics to insist that a large part of the Governmental expenditures should be paid by German reparations rather than by taxes collected from the French themselves, but in the absence of reparations the budget wouldn't balance, and budgets must balance or governments find themselves in the same plight as private enterprises which can't pay their bills.

Recent news from Europe has been the most encouraging since the war. Nothing is to be gained by exaggerated expectations of early stability and rehabilitation, but unless all signs fail, unofficial American participation in a business-like attempt to seek a solution of Germany's economic difficulties and the reparations muddle will bring far-reaching results.

Is Pleasure a Vice?

IS pleasure a vice? That is the question which Alvin Macauley answers in the negative in an article appearing on other pages of this issue. He refers particularly to the use of automobiles for pleasure purposes, but he propounds a philosophy which might be exploited to advantage throughout the business life of American executives.

The creed of efficiency, like others which retain their dogmas after their original meaning has been lost, bids fair to overreach itself. A method which results in economies when applied moderately will not necessarily continue to yield better and better returns when applied to the *n*th degree. Practical experience already has established a point of diminishing returns.

The chief difficulty with the efficiency creed is the tremendous amount of self deception which it fosters. The executive in good health who steals away at 4 o'clock to get in nine holes of golf before dinner may tell himself and his friends that he does it to increase his business efficiency, but only one in a hundred really would have left the office early if "increasing his efficiency" involved mowing the lawn instead of walking over the links. The reason is plain: Playing golf is fun. And deep in our consciences most of us know that the chief aim of our lives is to find lasting happiness.

Pleasure, beauty and happiness are not wicked, never have been, and never will be. Why be ashamed to seek them?

Producers Watching Sales Field Closely

At the Same Time They Are Maintaining Factory Schedules at a High Level

NEW YORK, March 17—Caution is being evidenced in manufacturing operations to avoid producing a greater number of automobiles the first quarter than can be readily absorbed. At the same time, producers of some of the standard lines, particularly those in the medium priced field, expect a shortage of cars to develop as soon as the spring selling season gets under way, owing to the sustained current demand.

While schedules are being maintained on a high level, the sales field is being closely scrutinized. Manufacturers wish dealer stocks to be sufficiently large to meet the spring demand, yet not so large as to overload the market. Sales have been going strong and will show a perceptible increase from now on.

As was the case last year, producers will be governed in their operations solely by conditions in the field. As long as the demand continues strong, high programs will be maintained, but with the appearance of a slackening they will be curtailed. Up to now efforts of manufacturers have been directed toward seeing that the early spring demand could be met without buyers being faced with backward deliveries.

Heavy Buying Season Due

This month will usher in the heaviest buying season of the year in most sections of the country, and indications point to active sales through April and May at least. If the usual sales curve is followed, June will show a slight falling off, marking the end of the high point in buying.

Conditions in the truck field continue encouraging, with plant schedules advanced as a stronger demand for the vehicles is reported. Bus line expansion is being reflected in greater activities of truck producers. The growth of the motor bus as a medium of transportation will form an important item in the expanded operations at truck plants, where both chassis and bodies are made. The production of rail cars is another end of the truck branch of the industry that is aiding to keep operating at a satisfactory point.

Automotive exports show marked improvement over the same period of last year. Many countries are buying heavily, the change of season abroad making those territories in the northern part of the world the most important at this time. The prospect that Germany will shortly lift restrictions on automotive products has occasioned widespread interest in the industry. Many inquiries from German dealers are now being received and actual business is in sight.

The general improvement in the European situation, particularly as regards the franc situation, is being interpreted by exporters as pointing to better industrial and economic conditions throughout the world. While France is not regarded as offering a large market for American cars, it is believed that the expected accord on reparations will have a repercussion on automotive sales in other foreign fields.

Business in Brief

NEW YORK, March 17—Industry, particularly in steel, automobiles and building materials, is more active than trade, which is irregular, spring business being held up by a combination of adverse weather, bad roads, price uncertainties, a late Easter and the situation at Washington. It is particularly noteworthy, however, that permits issued for building last month were the third largest monthly total on record.

Railroads are being kept busy, as indicated by the reports on car loadings, the week ending March 1 showing 945,049, in comparison with 845,898 the week before and better than the same week a year ago. The count for the first nine weeks of 1924 makes an interesting showing, with a total of 7,924,617 loadings of revenue freight, against 7,654,218 in the same period a year ago.

Bank clearings are down, the week ending March 13 showing a drop of 16.3 per cent from the preceding week, with a total of $7,377,131,000. Even compared with a year ago it is 2.6 per cent less.

Crop reports show that on March 1 the total farm reserve of grain was 1,777,000,000 bushels, in comparison with 1,712,000000 a year ago. Corn was 772,277,000 bushels in nine leading States, compared with 683,406,000 bushels last year. Exports up to March 1 were 120,000,000 bushels, a reduction of 60,000,000 bushels from last year.

The market reported stocks quiet and irregular, bonds generally firm, and money steady.

Wants Chassis Taxed, Not Complete Truck

N. A. C. C. Legal Counsel Suggests Clarifying Amendment to Revenue Bill

WASHINGTON, March 18—The revenue bill, containing the reduction of $25,000,000 in excise taxes on automobile parts and accessories and motor trucks, which was to have been reported out of the Senate Finance Committee this week, will remain with that committee for three or four more weeks. This was indicated today by members of the committee who are laboring with the tax experts of the Treasury to ascertain just what amount the bill will provide as passed by the House, three weeks ago.

Under the original estimate as made by the Senate Finance Committee and announced by its chairman, Senator Reed Smoot, the bill as passed by the House would result in a deficit of $100,000,000. A recheck of the figures by government experts, however, indicates that the deficit under the House bill will be approximately $55,000,000.

Counsel Makes Suggestion

As far as the automotive industry is concerned the latest development in the section covering its products is a change in the reading of the amendment suggested by legal counsel of the National Automobile Chamber of Commerce.

Under the provisions of the House bill the exemption of trucks and wagons whose chassis sell for under $1,000 means that a truck or wagon whose chassis sells for $1,001 is subject to the full 3 per cent tax on its entire selling price, thus putting a sudden sales resistance at this point, the Chamber's legal counsel points out. One way of avoiding this, it is declared, is to allow exemption from the tax on the first thousand dollars of the chassis' selling price.

In the case of a truck whose chassis' selling price is just above $1,000, the manufacturer may have various dealers who are given varying rates of discount based on the annual volume of business done by the dealer.

Affects Rural Dealer

The result is that if the truck is sold by a small dealer in a rural community it bears the full 3 per cent tax because the manufacturer's selling price as discounted to the rural dealer works out at $1,010, whereas the dealer of this truck in a large metropolitan area, doing a larger volume of business and therefore getting a larger discount, would probably purchase the chassis at $990 so the truck sold by him would be tax free.

Another point is that the body manufacturer selling a body of the size and weight suitable for mounting on a chassis for about $1,000 will have enormous

(*Continued on page* 692)

State Officials Urge Gasoline Price Probe

Attorneys General Want Federal Trade Commission to Prosecute "Trust"

WASHINGTON, March 17—Steps to regulate the petroleum industry should be taken at once and a nation-wide campaign launched to reduce the price of gasoline. Such is the recommendation received by the Federal Trade Commission, which has been called upon by the executive committee of the national conference of attorneys general, to make the investigation.

A recommendation has also been received by President Coolidge and the Department of Justice, to the effect that if the present law does not give the Federal Trade Commission sufficient authority to prosecute the "gasoline trust" it be given the needed authority by the enactment of new legislation.

The committee which met in Chicago last week outlined a program of activity and has sent copies of it to Congress with the request that "a special and sufficient appropriation to the Federal Trade Commission for the conduct and prosecution of the work be made."

Reciting that "the industry seems to be under such control that prices may be raised overnight at every gasoline station in the nation," the statement demanded "that all unfair trade practices in the production, manufacture and distribution of gasoline and other petroleum products be abolished without delay."

Through the advent of 15,000,000 automobiles in the country the use of gasoline has become a necessity of life and is essential to the welfare of the people, the committee of attorneys general points out, adding in its recommendation to the President:

> We suggest that all in authority, either in the States or in the Federal government, give consideration to this question of gasoline prices and other petroleum products which are so essential to the welfare of not only the 15,000,000 automobile users of the country but to thousands of other users.
>
> Nature has supplied an abundant store of petroleum, which geologists inform us will provide for a long period of time. It is a natural resource. The people are entitled to its use at a reasonable price. Exorbitant and extortionate prices should not be tolerated.

250-Acre Site Acquired for Ford's London Plant

DETROIT, March 18—The Ford Motor Co. confirms the report as wirelessed to the New York *World* in a copyrighted message from London that it has purchased a 250-acre factory site on the banks of the Thames in the eastern outskirts of the city, on which will be erected a plant four times the size of the one at Manchester.

The Ford company, however, is not yet ready to announce the details of the plan. It is said that it is proposed eventually to manufacture an all-British Ford in the London plant, which will save the 33⅓ per cent import duty and enable the company to lower its prices on its product as sold in Great Britain.

Year Will Show Place That Smaller Manufacturer Has in Automobile Industry

AN INTERVIEW WITH HENRY W. BURRITT,

General Manager and Treasurer of the Gray Motor Corp.

By D. M. McDonald,

Detroit News Representative of the Class Journal Company

DETROIT, March 19.

THE theory that one manufacturer, or small group of manufacturers, can corral all the automobile business if they can make enough cars to meet all the demand is due for a thorough test, and the general indications of the present year thus far are such that the facts or the fallacy may be amply shown as the year progresses.

This, declares Henry W. Burritt, general manager and treasurer of Gray Motor Corp., is the most interesting test that the automotive industry is being put to during the present year. Production facilities of the larger manufacturers are practically at peak, and if it is possible that all buying can be diverted into comparatively few channels simply by the ability to meet the demand, this year should fully demonstrate it.

The general experience of the automobile business in the past twenty years, however, argues against any such complete domination of the entire field, Mr. Burritt asserts. There has always been and always will be a large potential market for the car that is different if the proper methods are taken in its development and its marketing. Public taste has always been an uncontrollable factor, though dominated to some extent by price considerations.

The very multiplicity of numbers necessarily limits the style. Manufacturers aiming toward appeal on a price basis, and this is really the only basis upon which large production schedules can be formed, are compelled to eliminate the individual touches that, after all, have a distinct appeal with many owners and prospective buyers.

These the smaller car manufacturer can provide, and it is to the development of a larger volume of this business among owners of small cars that the Gray organization is devoting its effort, Mr. Burritt said.

In the presentation of its present line of cars, the company has treated the price element entirely as secondary and is making its bid for business purely among the quality buyers in the low priced field. The thought of the company, Mr. Burritt said, is to interpret the desires of a large number of buyers who want a small car, not necessarily the lowest possibly priced car. Though the price class in which its product falls is an individual one, this was not the direct aim of the company, but rather a circumstance incidental to bringing out a car enumerating the features which it wished to present.

Individuality in a small car, too, is not necessarily a product of demand from city owners alone, says Mr. Burritt, but is representative of a demand that exists in every section of the country regardless of locality. Although the average run of small car in the country districts is considered strictly with utilitarian and economic advantages in mind, there is a certain percentage of buyers who want cars for dress-up purposes. In a certain sense this demand may be attributed to the younger generation on the farm, which sees the car that is different.

In the demands made upon dealers by reason of the heavy factory production schedules, Mr. Burritt also sees a growing advantage for the manufacturer who is in a position to govern his production more in accordance with actual movement of cars at the retail end. Overloading of dealers can only compel them to do business at a disadvantage or force them over, if they wish to continue in automobile selling, into representing manufacturers with more flexible schedules.

ACT ON PAINT STANDARDS

WASHINGTON, March 19—Standardization of paint and varnish colors used in the automobile and carriage industry was recommended at a meeting of approximately 80 per cent of the paint and varnish manufacturers, meeting with the officials of the Department of Commerce, in its standardization program.

Transport Motor Truck Placed in Receivership

DETROIT, March 18—Roland Crandall of Chicago has been named receiver of the Transport Motor Truck Co. of Mt. Pleasant, Mich., by Federal Judge Tuttle.

The proceedings were instituted by the First National Bank of Chicago, the Goodyear Tire & Rubber Co. and the Old National Bank of Grand Rapids. The company is five years old and is declared to be solvent.

Bills amount to $400,000 and officials say they have been offered $350,000 for the company.

Willys Corp. Receiver Pays Claims in Full

Disburses Total of $15,300,000—Corporation Approaching State of Dissolution

NEW YORK, March 17—Only a Government claim of about $1,500,000 against the Duesenberg Motors Corp., one of its subsidiaries, prevents the dissolution of the Willys Corp. receivership. This claim is on account of war contracts and a final determination in favor of the Government might require additional payments.

The present status of the corporation was brought out last week when Receiver Francis C. McCafferty paid a 10 per cent dividend to creditors, necessitating the disbursement of about $1,500,000 and bringing the total to 100 per cent on the dollar on all adjudicated claims. This payment liquidates in full claims of $15,300,000 which remained after reductions of the original claims of about $30,000,000 which were filed against the corporation.

Equity for Stockholders

An accounting by the receiver showed on Oct. 5, 1923, cash of $793,930, treasury certificates of $1,500,000, and miscellaneous investments of $992,075, a total of $3,286,005. Present indications are that there will remain a substantial equity for the first preferred stockholders of the Willys Corp. when the final accounting is made, if the claim against the Duesenberg Motors is disallowed or reduced.

When the corporation went into receivership on Nov. 26, 1921, at Toledo, it owed banks more than $10,000,000, and the balance of $5,000,000 in debts was due largely to merchandise creditors. The total of $15,000,000, which has been paid out by the receiver, is probably the largest cash distribution ever made under any receivership in New York courts.

Incorporated in 1917

The Willys Corp. was incorporated July 24, 1917, in Delaware as the Electric Auto-Lite Corp., and the present name was adopted in September, 1919. Its capitalization consisted of 5,000,000 shares of common of no par value, $15,000,000 8 per cent cumulative convertible first preferred, par $100, and $10,000,000 7 per cent cumulative convertible second preferred, par $100. It acquired the business and assets of the Auto-Lite Co. of Ohio, engaged in the manufacture of electric starting and lighting systems, and in 1919 it secured the entire capital stock of the New Process Gear Corp. of Syracuse, N. Y., and of the Duesenberg Motors Corp., with plants at Elizabeth, N. J., and Poughkeepsie.

Following the receivership the plant at Elizabeth was sold at auction to W. C. Durant for $5,525,000, and at present is being used for the manufacture of Star and Durant cars. The Poughkeepsie plant was bought by C. O. Miniger, president of the Electric Auto-Lite Corp. for $300,000, while Durant interests purchased the plant and assets of the New Process Gear Corp. at Syracuse for $2,100,000. This completed the liquidation of the physical properties.

Mr. McCafferty on Nov. 28, 1921, reported a list of concerns in the automotive industries whose stocks, bonds and notes represented investments in and advances to by the Willys Corp., which were valued at $7,067,225. Among those listed were the Willys-Overland Co., Fisk Rubber Co., U. S. Light & Heat Corp., Federal Rubber Co., Jackson Motors Corp., Knight American Patents Co., Connecticut Telephone & Electric Co. and Doehler Die Casting Co.

Officers of the Willys Corp. were: John N. Willys, president; W. P. Chrysler, executive vice-president; J. R. Harbeck, vice-president; C. O. Miniger, vice-president; C. R. Burt, vice-president; Jay V. Hall, vice-president; D. T. Welsh, treasurer, and C. B. Mertz, secretary. The directors were Messrs. Willys, Harbeck, Miniger, Kepperly, Mertz, Chrysler and Hall.

FREIGHT RATES LOWER ON AMERICAN VESSELS

WASHINGTON, March 17—A reduction in ocean freight rates can be obtained by automotive exporters under an order issued by the Interstate Commerce Commission making effective the provisions of Section 28 of the Merchant Marine Act of 1920. Under these provisions a reduction is possible when a through export bill of lading is used and an American vessel is specified as carrier.

As an illustration of the saving that can be made by exporters availing themselves of these provisions, it is stated that shipments of passenger automobiles from Detroit to United Kingdom ports by way of New York in American vessels will take the through export rate of $2.02½, as against the rate of $2.42 per cwt. when the shipments move in foreign vessels.

The provisions become effective May 20, 1924.

OLDS WORKING NIGHT SHIFT

LANSING, MICH., March 17—The Olds Motor Works has put on a night shift in all of its principal manufacturing divisions, bringing the total number of employees to 4500. Production now is on a 500-a-day basis. Sales are reported 300 per cent greater in the five months the company has been producing its new six-cylinder car than in the same months a year previous.

Philadelphia Dealer Would Build Mercer

Curran-McDevitt Co. Acquires Unencumbered Assets for $40,000—Plant Not Sold

TRENTON, N. J., March 17—The Curran-McDevitt Co. of Philadelphia, which has been the Mercer agency in that city for the last three years, aspires to become the manufacturer of Mercer cars, continuing a long business which was interrupted a year ago through receivership proceedings.

As a step in this direction, the Philadelphia company today bought for $40,000 the unencumbered assets of the Mercer Motors Co. of this city, valued at $75,000 by a recent inventory. The purchase included the Mercer good will and name, inventory and raw material.

Now it remains for the Philadelphians to secure the plant, machinery, equipment and land, which is to be disposed of at a separate sale. If they make this purchase they intend, it is stated, to manufacture Mercer cars in the local plant. Failing, they will locate somewhere else.

The Mercer real estate, comprising the factory proper and thirteen acres of land, is encumbered by a mortgage of $450,000, held by the United States Mortgage & Trust Co., and it is proposed to sell this as a unit. With this end in view, the bondholders have until April 2 to show cause why the sale should not take place.

If this sale is held, the affairs of the old Mercer Motors Co. will be wound up. It is said that secured creditors will get only four or five cents on the dollar, while the stockholders will get nothing. Those secured by the first mortgage on the property will realize 50 or 60 cents on the dollar, it is reported. When the receivership was declared the company owed $1,700,000 to the unsecured creditors.

Bates Tractor Creditors Agree to Reorganization

JOLIET, ILL., March 17—By an order from Judge Cliff of the Federal Court it is expected that the financial difficulties of the Bates Tractor Co. of this city will be adjusted through an arrangement, by which settlement of the company's liabilities of $400,000 will be in the hands of Oscar Laraway, referee in bankruptcy.

Assets are put at $1,000,000, represented largely by manufactured products, for which, it is said, there is little demand, due to agricultural depression. By diverting the output of the factory to road-making machinery, instead of farm, it is hoped to place the operations upon a profitable basis. The petitioning creditors have agreed to certain reorganization plans and the early resumption of production.

Steam Vehicle Corp. to Produce Stanley

New Company Also to Make Buses and Trucks and Vehicles for Railroads

SYRACUSE, N. Y., March 17—The Steam Vehicle Corp. of America of this city, recently organized, has taken over the Stanley Motor Carriage Co. of Newton, Mass., and the Steam Bus Syndicate of Chicago. The merger will cater to three distinct automobile interests—passenger cars, trucks and buses, and steam vehicles for railroad use.

The Stanley plant and assets, valued at $572,204, were purchased from the receiver, S. L. G. Knox, the Steam Vehicle corporation agreeing to give the Stanley creditors Class B second preferred non-cumulative stock in full at par to the amount of their claims, with the understanding that one-third of net earnings, after providing for dividends on first preferred and second preferred, shall be set aside for the retirement of the Class B preferred stock.

It is planned to resume the manufacture of the Stanley steamer at once in the plant at Newton under the direction of Jacob E. Gremlich of Fayetteville, who has been identified with the Watson Truck Corp. of Canastota, N. Y., and previous to that with the Sanford Motor Truck Co. of Syracuse.

To Use Winslow Boiler

Steam buses and steam trucks will be manufactured in the plant at Canastota by what is known as the White division of the corporation because of the fact that it is in charge of Raymond E. White, formerly production manager of the Duesenberg engine plant at Elizabeth, N. J. It is proposed to use in these buses and trucks the Winslow high-pressure steam boiler, which has been developed by the corporation.

The parent concern, the Steam Vehicle Corp. of America, was first incorporated with only $50,000 of first preferred stock, $50,000 of second preferred and 1500 shares of common, but when it was proposed to enter into the deal for the Stanley plant and business, this capitalization was increased to $500,000 of Class A first preferred, $500,000 of Class B second preferred and 5500 shares of no par common.

Theodore Williams President

Officers of this holding corporation are: President, Theodore Williams, of Syracuse, who also is in charge of operations either as president, treasurer, or general manager of eight or ten other manufacturing plants, directly or indirectly controlled by the same interests which put through the reorganization; vice-president, Charles A. Brown of Chicago, patent attorney; secretary and treasurer, Charles R. Chapman of Syracuse, and assistant secretary and treasurer, Kenneth C. Brown, formerly of Chicago but now of Boston. Levi S. Chapman of Syracuse, Walter J. Conlon of Chicago and Arthur H. Boettcher of Chicago are other directors.

Syndicate Does Experimenting

CHICAGO, March 17—The Steam Bus Syndicate of Chicago, which has been acquired by the Steam Vehicle Corp. of America, is an experimental organization formed with the object of developing a steam bus.

The company was formed by Page, Beck & White, a firm of automotive engineers of this city, and one experimental bus has been built. In this bus a Winslow steam boiler is used. The company's assets, which have been transferred to the Steam Vehicle Corp., consist chiefly of patents and plans for steam vehicles.

CANADIAN PRODUCTION WAS 145,357 *IN* 1923

TORONTO, March 17—Statistics covering Canadian automobile production in 1923 show that a total of 145,357 cars and trucks were manufactured in the Dominion last year, of a wholesale value of $96,250,153, in comparison with 97,904 cars in 1922, 65,355 in 1921, 97,868 in 1920, 78,462 in 1919, 82,408 in 1918 and 93,810 in 1917. Exports were 65,716 vehicles, representing a value of $35,131,221.

Capital invested amounts to $56,028,616, of which tire manufacturers are represented with $36,004,339. There are 10,982 persons employed in the car factories, earning $17,292,433 in salaries and wages. Parts and accessory makers employ 8184 and pay out $9,225,701 in salaries and wages.

Durant to Manufacture Own Engines at Flint

NEW YORK, March 17—W. C. Durant, Carroll Downs and Charles F. Daly, leading executives of Durant Motors, Inc., are the incorporators of the Eagle Engine Works, which received a Delaware charter last week. The new company has an authorized capital of 2,000,000 shares of no par value common stock.

As to the plans of the new company, Mr. Durant states that a formal announcement cannot be made for at least a week. It is said, however, that the new engine plant will be located in Flint.

WALKERVILLE PLANT CLOSED

DETROIT, March 15—The Walkerville plant of Fisher Body Co. closed this week, due to the fact that Ford Motor Co. of Canada is now manufacturing all its own bodies. Part of this business was formerly handled by the Fisher plant. Most of the 1000 men formerly employed are reported to have found work in the Detroit body plants.

"Utilitor" Purchased by Chicago Concern

Midwest Engine Corp. Disposes of Assets—Wallace Bear Retained as Manager

INDIANAPOLIS, March 19—The Automotive Utilities Corp. of Chicago has purchased the Utilitor assets and rights from the Midwest Engine Corp., successor to the Midwest Engine Co. The Utilitor Co., a subsidiary of the Chicago concern, will continue to manufacture the tractor in Indianapolis.

Two one-story buildings in the Midwest enclosure which now house various departments of the Utilitor division have been leased and in these the tractor business will be conducted. Wallace Bear, who has been in charge of the division since the reorganization took place, has been retained by the Utilitor Co. as general manager.

Mr. Bear states that last year a considerable amount of Utilitor business was done, both domestic and foreign. Although the Midwest corporation devoted most of its energies to the repair of rail freight cars, engine manufacture was continued, and a limited amount of work was done on the Utilitor division, but this was largely confined to the sale and distribution of manufactured stock.

Possibility of Good Growth

The showing made by the small tractor division attracted the Automotive Utilities Corp., and though no forced expansion will be attempted there is a possibility of considerable growth.

The Utilitor has been selling at $100 with $52 extra for a complete set of tools. This price is about one third of the original price. Most of the tractors have gone into truck gardening, florist work, cultivation of orchards and other light agriculture.

Court orders of this week disclose that the Midwest Engine assets will be closed out entirely.

Wagon Company Acquired by Columbia Body Corp.

COLUMBIA, PA., March 17—The Columbia Body Corp. has been organized to take over the Columbia Wagon & Body Co., whose net assets are reported to be worth $500,000. Michael R. Hoffman, owner of the Columbia Wagon & Body Co., also holds all of the stock in the new company, of which he has been named as president.

M. R. Hoffman, Jr., is treasurer and Guy S. Hoffman secretary. George W. Hall, formerly vice-president of the Martin-Parry Co. of York, Pa., is general manager and sales agent. The corporation will continue the manufacture of horse-drawn vehicles but will bring out a line of commercial automobile bodies which probably will constitute seven-eighths of its business.

Olds Accessory Plan Is Individual Policy

Executives of Other G. M. Units Will Use Own Discretion as to Taking It Up

DETROIT, March 19—The General Motors Corp. has not committed its car producing units to any set policy on accessories, and whether any other units follow the lead of the Olds Motor Works in the sale of accessories to its dealers is a matter of individual determination. It is questionable, in the minds of leading executives of the corporation, whether all units could apply this accessory plan successfully, and it will be left to each to make its own decision.

General Motors, it is emphasized, is strictly in the business of manufacturing and selling accessories. Olds' action in carrying a certain number of standard accessories is not a movement by that unit to enter the accessory field, but is designed solely to broaden the market for the car. Oldsmobile executives, acting under the individual authority granted to each unit to conduct its own business, choose to provide for standard accessories as offering greater opportunity for car sales.

Handles Only Special Equipment

It is further emphasized by the corporation that the Olds company is not handling a general line of accessories, but the special equipment used on its sport and special models, which it is making available for the entire line at the discretion of the buyer.

The car has been redesigned for the installation of any or all of these accessories, so that there will be no damage to the car in the installation, or large service charge to the buyer for the work.

The question of each unit designing its products for the use of certain accessories, and in turn sale of these through the factory has been considered informally. There was a question by some of the executives as to the results to be gained, and the point never was pressed, it being left to the future to determine whether the accessory combination could be used successfully in promoting sales in their particular divisions.

In the meanwhile the experience of the Oldsmobile division in its plan will be carefully studied. Executives of other divisions will have an opportunity to consider the proposition according to the developments at the Olds factory, and their course to a large extent will be governed by the results there.

BUY SITE FOR "BROWN" CAR

SYRACUSE, N. Y., March 18—The Brown Development Co. has purchased a site between Eastwood and East Syracuse, on which it proposes to erect a plant for the manufacture of the Brown car, which has been in course of development for some time. It is proposed to organize a production company with a capitalization of $1,000,000, and it is hoped to be in production by the end of the year.

The Brown car is to carry a six-cylinder air-cooled rotary engine, which is to be located in the rear of the chassis. The price will be around $2,000.

REO WILL BROADCAST FROM LANSING PLANT

LANSING, March 17—Reo Motor Car Co. will install within the next four months a complete radio broadcasting outfit at the factory, negotiations being now completed. The broadcasting studio will be fitted up on the top floor of the engineering building. Arrangements for the Federal license have been made, and the station symbols and broadcasting hours will be announced later.

The Reo company plans to broadcast a program two or three times weekly, using to a large extent the talent available within the factory. The company already has a band and a glee club. It is expected to realize considerable advertising value both for the company and the city of Lansing as result of the operation of the station.

$1,821,000 Debts Shown by R. H. Long Companies

BOSTON, March 18—Guy Murchie, receiver for the R. H. Long Motors Co. and the R. H. Long Co., has filed a report which shows that the two concerns owe $1,821,000 and have assets, if the receiver is given time to realize upon them, of $2,332,172. The receiver states that, while the R. H. Long Shoe Co. is not in the hands of a receiver, its affairs are so closely linked with the other two that he considers the three as one concern in the statement of assets and liabilities.

It is suggested that a creditor's committee be named to hold the stock of a new corporation and the stock of the present companies, so that the business may be continued.

Delivery of Chrysler Cars to Owners Starts

DETROIT, March 19—First deliveries to owners of the Chrysler car were made this week, this action having been deferred until the company had been enabled to get at least demonstrating cars to each of the 2000 dealers.

According to J. E. Fields, general sales manager, the Chrysler Motor Corp. is now building close to 100 cars daily and is several months behind on orders accumulated since the first showing in New York. The company plans to build 30,000 this year, it is announced.

Better Profit Shown by American Bosch

Last Year Showed Net of $94,075 Compared with $2,332 Reported in 1922

SPRINGFIELD, MASS., March 20—A better year was experienced in 1923 than in 1922 by the American Bosch Magneto Co., the annual report showing an operating profit of $148,711, in comparison with $25,914 in the preceding twelve months. This is equivalent to 97 cents a share earned on the 96,000 shares of no par capital stock, in comparison with two cents in 1922, the net profit being $94,075, against $2,332.

The consolidated balance sheet reports assets of $10,443,655, which includes $197,732 cash, against $275,907 in 1922; $1,054,752 notes and accounts receivable, compared with $1,021,167; $3,175,395 inventories, against $3,385,284; $294,477 deferred charges, contrasted to $270,275; $1,232,442 investments, against $1,225,433; $3,898,678 real estate, plant and equipment compared with $3,348,698; and $594,176 patents.

Liabilities are made up of $6,110,779 capital stock and surplus; $1,889,528 notes and accounts payable; $69,348 accrued accounts and $2,374,000 gold notes.

New Atwater Kent Plant Will Be Ready in August

PHILADELPHIA, March 17—Demand for its radio and automotive electrical equipment having developed so rapidly, the Atwater Kent Manufacturing Co. has found it necessary to erect a new plant, which will be finished by August. This will cover more than ten acres, on which will be erected a one-story building of sawtooth construction, which will cost nearly $2,000,000.

The company will continue the present plant for the manufacture of automotive electrical equipment and certain radio parts. When both plants are in operation, several thousand people will be employed.

Tire Exports in January Amounted to $1,005,404

WASHINGTON, March 19—Exports of tires and tubes from the United States during January amounted to $1,005,404 in value, consisting of 72,426 pneumatic casings and 76,091 inner tubes.

Figures compiled by the Bureau of Foreign and Domestic Commerce show that during the month England proved to be the best customer of the United States, taking a total of $175,000 of these products, with Japan a close second, importing $162,000 worth.

The January exports of tires and tubes went to eighty-five countries and average approximately 15 per cent over the exports for similar commodities in January, 1923.

Spring Buying Move Behind Other Years

As a Result Factory Output Will Be Less in March—Some Schedules Curtailed

DETROIT, March 20—Passenger car production for March probably will fall considerably short of the mark set last month. Several of the larger companies have curtailed operations rather sharply and will operate on reduced schedules for the time being.

This condition has resulted from the fact that the spring buying movement has not started as early as it did last year, when most factories were unable to supply the needs of dealers. A later spring in most sections of the country, after an unusually open winter, with heavy retail sales, is chiefly responsible for this backwardness in buying.

There has been a considerable backing up of cars for some companies, therefore, because they have been building up reserve stocks for several weeks in the expectation that retail sales would increase sharply with the approach of April.

Reluctant to Take Cars

One of the main difficulties at present is that dealers operating under distributors are reluctant to take cars, asserting that they intend to wait until they actually have orders before they accept shipments. Dealers with direct factory connections already have accepted all the cars they can take care of for the present.

The curtailment of output is causing no apprehension, however, because few close observers have expected that operations could be continued throughout the year at the pace which was held the first two months. It means merely that manufacturers propose to proceed cautiously and take no chances on supply exceeding demand.

Martin-Parry Net Sales Reported at $5,951,166

YORK, PA., March 17.—The annual report of the Martin-Parry Corp. shows net sales of $5,951,166 for 1923, against $4,327,685 in 1922. Net operating income was $767,324, contrasted to $445,774. After deductions, net profits were $653,066, against $402,248, equal to $6.53 a share on the 100,000 shares of no par stock outstanding.

NO STEINMETZ RECEIVERSHIP

The statement in the March 13 issue of AUTOMOTIVE INDUSTRIES that the Steinmetz Electric Motor Car Corp. of Baltimore is in a receivership was in error. While action asking for the appointment of a receiver is pending, the company expects to be able to defeat this and also aims to refinance and continue the manufacture of the Steinmetz electric truck. The company claims its total indebtedness is only $40,000, and that the sale of its three year 7 per cent gold coupon note issue will produce sufficient funds to enable it to wipe out this indebtedness and continue operations.

ARMY PLANES START TO ENCIRCLE GLOBE

SANTA MONICA, CAL., March 17—The Army's bold attempt to send a fleet of four airplanes around the world is now on, the flyers starting from here this morning, with Sacramento the first night's stop. It is expected it will take six months to complete the journey, in which time 30,000 miles will be covered.

The personnel of the party is: Ship No. 1, Major Frederick L. Martin, Sergeant A. L. Harvey, mechanic; ship No. 2, Lieutenant Lowell Smith, Sergeant A. H. Turner, mechanic; ship No. 3, Lieutenant Leigh Wade, Sergeant A. H. Ogden, mechanic; ship No. 4, Lieutenants Erik Nelson and John Harding.

At Seattle the land gear will be changed to pontoons for the long beat along the Alaskan Coast and across the Aleutian Strait. The pontoons will be changed to land gear at Calcutta and resumed again at London. At San Stefano, near Constantinople, new engines will be installed.

Glancy Acquires Samson Foundry at Janesville

JANESVILLE, WIS., March 17—The Glancy Malleable Corp. of Waukesha, Wis., which a year ago took over the Waukesha malleable foundry of the Samson Tractor division, General Motors Corp., has now acquired the gray iron foundry built as part of the new plant of the Samson Tractor Co. at Janesville, and is converting it for malleable casting processes.

The Samson company liquidated its business about two years ago, and the big plant built in Janesville about five years ago has since been given over to a Chevrolet assembling plant and a Fisher body building branch.

The Waukesha foundry, taken over by General Motors to insure an adequate casting supply for the Samson works, is furnishing a considerable part of the needs of the Buick and Chevrolet divisions, and as these requirements have increased greatly, it was decided to convert the Samson gray iron foundry for malleable output.

A. R. Glancy, head of the Glancy corporation, served the Samson company and later the Chevrolet division as foundry manager until he organized a company of his own to take over the operation of the Waukesha foundry under lease.

Low Research Funds Cut Bureau's Work

Standards Activities Will Suffer Because of Small Government Appropriation

WASHINGTON, March 18—Research work in the automotive section of the Bureau of Standards will have to be curtailed seriously at the end of the Government's fiscal year on July 1, inasmuch as its appropriation for the twelve months beginning at that time will be only $15,000.

This meagre sum will be supplemented by funds which become available from other Government departments for work they arrange with the Bureau to undertake, plus additional money which may be made available by such organizations as the National Automobile Chamber of Commerce and the American Petroleum Institute, especially for fuel research.

An erroneous impression was given by the statement of AUTOMOTIVE INDUSTRIES in last week's issue that the automotive section would be able to continue its operations for the remainder of the present calendar year. This applies only to the next three months instead of the next ten.

Protests May Be Too Late

The small appropriation made by the Budget Bureau for the automotive section is generally attributed to the fact that the budget makers were not given an adequate picture of the importance of the section's activity. Since that time vigorous protests have been made by automotive manufacturers, but they probably came too late. It was estimated that a minimum of $50,000 would be required for the work the section had planned.

The Congressional committees involved have the power to increase the appropriation, but are reluctant to do so on the ground that if they did they would reopen the whole question of departmental appropriations and, therefore, virtually nullify all that has been done by the Budget Bureau. It is possible but not probable, therefore, that a supplemental appropriation will be made by Congress for use in the coming fiscal year.

Pan-Americans to Visit Highway Show in South

WASHINGTON, March 18—The Pan American Highway Commission, consisting of a group of about forty leaders in the highway movement in the various countries of South and Central America, will attend the open-air demonstration of road building methods and machinery, which will take place in North Carolina June 4-7.

The demonstration will be in charge of the North Carolina State Highway Commission and sponsored by the American Road Builders' Association.

Miller Rubber Sales Increased in Value

Gain of 18 Per Cent Shown—Operating Profit, However Was Less Than 1922

AKRON, OHIO, March 17—Sales of the Miller Rubber Co. for the fiscal year ending Dec. 31, 1923, were $29,188,523, as compared with $24,754,344 for the previous year, an increase of 18 per cent in dollars and a greater increase in pieces, it was announced by Jacob Pfeiffer, president, at the company's annual meeting. Operating profit, depreciation, adolescence and income tax totaled $2,060,009 as compared with $2,756,607 for the previous year.

After providing for the normal preferred dividends, profits are equal to $25.36 a share on common as compared with $32.60 a share last year. This, by payment of deferred dividends and declaration for payment of all deferred dividends, absorbed $21.09 a share, leaving a balance of $4.27 a share for surplus.

The prospects for the ensuing year are encouraging, according to Mr. Pfeiffer, but with the advent of the balloon and semi-balloon tires it is thought that the company's requirements for fixed assets will be heavy. The plant is said to be in good condition with all major departments on a profitable basis, the ratio of current assets to current liabilities being more than 3 to 1.

The balance sheet shows current assets of $11,072,294 inclusive of $1,130,154, cash; $3,646,531, accounts receivable and $6,295,607, inventory. The current liabilities amount to $3,248,028 and embrace $1,200,000, notes payable; $1,635,864, accounts payable and $412,163, accrued charges.

Lee Rubber Reports Loss Due to Price Reductions

NEW YORK, March 17—The Lee Rubber & Tire Corp. suffered financially through the price cutting on tires last year, according to its annual report. After having a most satisfactory first six months in which profits were shown, the company experienced a falling off in the last half, with the result that it finished the year with a net loss of $71,813, compared with a profit of $370,493 in 1922. This, too, notwithstanding the fact that net sales in 1923 totaled $9,390,397, against $6,468,208 in 1922.

The company's annual report includes the Republic Rubber Co., which it purchased last year, from June 9 to Dec. 31. Its balance sheet shows assets of $15,361,504, against $5,612,907 the year before, and includes $1,075,651 cash, $1,724,520 accounts receivable, $154,131 in trade acceptances, $42,228 in notes receivable and $4,567,687 in inventories.

"The purchase of the Republic Rubber Co. substantially increased the asset value back of each share of Lee stock," President John J. Watson, Jr., declares. "Net assets as of Dec. 31, 1923, were $8,175,036, equivalent to $38.05 a share on all outstanding stock, compared with $4,594,681 at the close of 1922."

FORD COMPANY FILMS "ROAD TO HAPPINESS"

DETROIT, March 19—Ford Motor Co. is sending copies of its film, "The Road to Happiness," to all of its branches in the United States and is arranging for general showing.

The picture is designed to promote interest in better highways and is produced by the Ford Motion Picture Laboratory in conjunction with the Bureau of Public Roads of the United States Department of Agriculture, the Highway Educational Board and the National Automobile Chamber of Commerce.

President Coolidge appears in the film, presenting a scholarship to the boy hero of the story. The use of the film is free to all interested in the promotion of improved highways.

Result of Stevenson Act Satisfactory to British

LONDON, March 8 (*by mail*) — The rubber industry on this side of the Atlantic feels well satisfied with the way the Stevenson restriction act has worked out in the last fifteen months, giving it credit for the price increases which has taken place despite a sharp increase in production. Production, it is reported, was 411,361 tons in 1923, against 379,920 in 1922, 343,731 in 1920 and 241,579 in 1918.

In a summary of operations under the act, H. Eric of the British Colonial Office, which was responsible for the export restriction plan, says:

> Thanks to the increasing consumption of rubber, particularly in America, the Stevenson plan has worked very much as intended. Producers who are affected by the legislation are unanimous in appreciation of it, and nearly all British producers in the Dutch West Indies are of their own free will conforming to the similar regulation of exports.
>
> Last but not least, the American manufacturers, who take a long view, as was also taken by the Stevenson committee, are in every way satisfied that what has been done is in their interests as well as in the interests of producers.

BRAKE LINING STATISTICS

NEW YORK, March 17—The Asbestos Brake Lining Association is compiling for the Division of Simplified Practice of the Department of Commerce statistics regarding the demand for various sizes of automobile brake lining. The questionnaire which the association sent out has brought replies from practically every brake lining manufacturer in the country.

C. G. Spring Elects Two New Directors

Christian Girl Again Heads Company—J. J. Jennings Named as Secretary

KALAMAZOO, MICH., March 19—Christian Girl was re-elected president of the C. G. Spring & Bumper Co., at the annual meeting of the company. The other officers named are: First vice-president, Charles Getler; second vice-president, F. C. Cornell, and secretary-treasurer, J. J. Jennings. Judson S. Clary, secretary of the company since 1920, retired in favor of Mr. Jennings.

Two members were added to the board of directors. They are Arnold H. Goss, capitalist, Detroit and F. C. Finkenstaedt, banker and manufacturer, Bay City. The directors re-elected were Mr. Girl, Mr. Getler, J. G. Utz, Detroit; Dr. C. L. Bennett, D. B. Sharpe, Mr. Clary and Fred V. Wicks, Kalamazoo.

The headquarters were moved to Detroit. The directors authorized the payment on April 1 of the regular 2 per cent quarterly dividend on the preferred stock to stockholders of record of March 24.

Reports to the stockholders showed that the February sales exceeded those of January by 66½ per cent, and were also 36 per cent greater than for February, 1923. The Kalamazoo plant is operating on day and night shifts and is giving employment to approximately 300 men.

The stockholders also ratified action taken at the February special meeting, at which time the capital of the company was increased from 15,000 to 150,000 shares of no par common, also in changing the denomination of the outstanding preferred stock from $100 a share to $10 a share.

$12,526 Profit Netted by Seiberling Rubber

AKRON, March 17—Seiberling Rubber Co. reports that during its second year of business it sold $5,782,321 worth of products, as compared with $3,845,779, the previous year. Net profit, before charges, amounted to $124,202, as compared with $56,878 in 1922. Net, after charges, for 1923 reached $12,526.

The company in its statement calls attention to the low prices obtaining on tires during the second half of 1923, which accounts for the low profit for the year.

The balance sheet shows total current assets of $1,739,978, which includes cash, $159,381; accounts receivable, $546,801: notes and trade acceptances, $148,930, and inventory, $884,864.

The current liabilities aggregate $932,928 inclusive of notes payable, $614,359; trade acceptances payable, $79,780; accounts payable, $190,246, and accrued accounts of $48,542.

Pierce-Arrow Plans Moderate Priced Car

Will Be Introduced in Mid-Summer—List Figure Not Yet Decided Upon

BUFFALO, March 17—The Pierce-Arrow Motor Car Co. has entered upon a program of expansion which includes the production of a moderately priced passenger car built to present Pierce-Arrow standards of quality. Announcement of the company's plans was made today by President Myron E. Forbes at a meeting of the entire Pierce-Arrow distributing and dealer organization at the factory in Buffalo.

The new and smaller Pierce-Arrow will be introduced in mid-summer. Executives of the company said today they are not prepared to say now at what price the new car will sell. They stated that they themselves do not know and will not know until certain experiments, now being carried on, have been completed.

Special Star Roadster Is Ready for Delivery

DETROIT, March 19—Production at the Durant Motor Co. of Michigan plant at Lansing will approximate 7000 Stars and Durant fours in March, this number being increased to 10,000 in April and 11,000 in May.

A new special roadster has been added to the Star line and is ready for delivery this week. It will sell at higher prices than the regular roadster and will have a special body finished in radio blue with white striping, black upholstery and olive green top.

As regular equipment the model will carry disk wheels, cord tires, nickeled radiator, drum headlights, outside door handles, polished aluminum rear deck bars and tire carrier. Four-wheel brakes are optional equipment at higher prices.

Excelsior Motor Makes Eight-in-Line Engine

CHICAGO, March 17—Another eight-in-line engine has been added to the list of those made by American parts manufacturers. This product is placed on the market by the Excelsior Motor Manufacturing & Supply Co. of this city. It has a nine-bearing crankshaft and is fitted with overhead valves actuated directly by an overhead camshaft—a construction similar to that employed in the four-cylinder engine built by the same concern.

The new product has a 3⅜ in. bore and 4½ in. stroke and is said to develop in excess of 90 b.hp. at 2500 r.p.m., which is approximately the speed of maximum power.

Tools for the manufacture of the engine are now being made by the Taft Peirce Manufacturing Co. of Woonsocket, R. I., where the engine will be manufactured initially.

Cylinder block and upper crankcase are cast integrally in iron. Underpan, valve cover, bellhousing and gear casings are of aluminum. The camshaft is driven by spiral bevel gears and a vertical shaft. The latter also drives through helical gears a cross shaft for timer and water pump and a three-blade aluminum fan. The lighting generator is driven by chain off the front end of the crankshaft.

Pistons are of aluminum alloy, as are also the forged connecting rods. A high-pressure lubricating system furnishes oil to all bearings, including those on the piston pins.

American Bosch Magneto Employs More Than 2000

SPRINGFIELD, MASS., March 17—The American Bosch Magneto Corp. has increased its production force steadily since Jan. 1 and now has more than 2000 at work. A. H. Bartsch, general sales manager, reports interest as exceedingly keen in new products and improvements, and says the sales force is being increased in accordance with the improved situation in different territories. The sales research department is being expanded in order to maintain closer contacts with all parts of the field.

The factory is going strong on starting and lighting and battery ignition outfits, and considerable improvement is reported in the agricultural trade, sales of Fordson magnetos and Fordson governors being 50 per cent ahead of a year ago.

Jewett Motors Produces $1,250 Business Coupe

DETROIT, March 19—Jewett Motors is producing a new model called the business coupe. This car is produced as a standard model only, including the regular Jewett chassis, and sells for $1,250 f.o.b. factory.

The body seats two or three passengers, is finished in dark blue with a hair line stripe, and is trimmed in pebble grain leather on the seat back and cushion, with Fabricoid on the door panels and the lower portion of the interior and a head lining of wool coach cloth.

The seat is 45 in. wide. Back of the seat and inside of the body is a package compartment 34 in. long, 7 in. wide and 14 in. deep, which is useful for carrying sample cases or small packages. Under the rear deck is a large luggage compartment, 47 in. long, 26 in. wide and 15 in. deep.

Fabric covering is used on the top and rear quarters and helps to keep down the weight and eliminate rumbles. Large windows in rear quarters add to the appearance and the range of vision. The body is built by the Erdman-Guider Co. of Saginaw, Mich. Standard equipment includes sun visor, windshield wiper, cowl ventilator, lock on right door and inside bolt on the left.

$4.64 Share Earned by Moon Last Year

Annual Report Shows Operating Profit of $818,012 and Net Sales of $9,741,857

ST. LOUIS, March 17—Moon Motor Car Co. earned $4.64 a share on its 180,000 shares of no par common last year, in comparison with $5.01 a share on 154,213 shares outstanding for 1922. The company's annual report shows net income of $842,008 for 1923, after interest, depreciation and Federal taxes, which is a better showing than in 1922, which reported $795,139.

The company's income account reports net sales in 1923 of $9,741,857, compared with $6,877,159. Expenses, including depreciation, amounted to $8,923,845, against $6,159,655, leaving an operating profit of $818,012, against $717,504. Dividends amounting to $251,558 were paid.

The company's assets, totaling $2,789,033, include cash of $281,062, $68,823 in notes receivable, $163,365 in accounts receivable, $8,931 in sundry accounts receivable and $1,380,224 in inventories.

During the year the company retired all its preferred stock.

McCord Radiator Reports Net Earnings of $888,896

DETROIT, March 15—The McCord Radiator & Manufacturing Co. in its annual report for the first fiscal period comprising the ten months ended Dec. 31, 1923, shows net earnings after all charges, excepting possible Federal taxes, of $888,896.

Of this amount the following application was made: For contingent additional taxes, $40,000; for reserve for retirement of class A stock, $180,000; for net amount of dividends on class A stock, $120,312, or a total appropriation from earnings of $340,312, leaving a balance of $548,584 carried to surplus.

Out of the last mentioned reserve 5000 shares of class A stock were purchased and retired. The balance sheet shows current assets of $1,837,884, against current liabilities of $355,828.

Stockholders in G. M. C. Now Aggregate 70,009

NEW YORK, March 17—The General Motors Corp. now has more stockholders than at any time in the history of the organization. This total, as was evidenced March 12, when dividend checks were mailed, was 70,009 in comparison with 68,063 at the end of the fourth quarter of 1923, 68,281 in the third quarter and 67,417 in the second quarter of last year.

The increase comes among the holders of common stock, which has increased from 46,587 to 48,568.

Men of the Industry and What They Are Doing

Executives Sail for Europe

B. G. Work, president of the B. F. Goodrich Co., sailed for Europe on the Aquitania, the same vessel that carried H. M. Jewett, president of the Paige-Detroit Motor Car Co., and Fred Alger, a director of the Packard Motor Car Co. Before sailing Mr. Work declared his belief that there will be more stability to tire prices, with no change in the near future.

Allmendinger Goes to England

E. D. Allmendinger, manager of the foreign department of the Black & Decker Manufacturing Co., has sailed for England, to remain abroad for several weeks on company business.

Changes with Durant of New Jersey

Harry L. Brown has been appointed general manager and Carl H. Page sales manager of the Durant Motor Car Co. of New Jersey. Mr. Brown, general manager of the Waltham Watch Co. before joining the Durant interests, has been serving as factory manager at Elizabeth. Mr. Page has been in the industry almost from the beginning, having been associated in executive capacities with White, Chalmers, Mitchell and American.

Lyman Joins Yellow Sleeve

Albert A. Lyman, formerly chief engineer of the Velie Motors Corp.'s engine plant at Marion, Ind., is now associated with the Yellow Sleeve-Valve Engine Works, Inc., East Moline, Ill.

Indian's Officials Coming Home

Frank J. Weschler, president of the Indian Motorcycle Co., and W. G. McCann, export manager, will sail from Southampton March 22 on their return from a visit to England, France and other European countries in the interest of the company.

Stickney Now with Yellow Coach

John H. Stickney, for many years identified with the automobile industry, has resigned as superintendent of the Stephens Motor Car Co. of Freeport, Ill., and has joined the Yellow Coach Manufacturing Co. of Chicago in an executive capacity.

Gray-Dort Promotes Byers

J. P. Byers has been elected vice-president and general manager of Gray-Dort Motors, Ltd., according to a report from Chatham, Ont. Mr. Byers was formerly secretary-treasurer of the company and has been connected with it since the organization in 1915. He will have complete control of the business. Announcement is also made of the retirement of Robert Gray, who has headed the company since its inception. W. M. Gray, his son, has retired as vice-president and assistant general manager. W. E. Finnigan, Hamilton, who for several years was assistant sales manager of the company, has returned as general sales manager.

Laporte Is Assistant General Manager

L. A. Laporte, Holyoke, Mass., has been appointed assistant general manager of the New England Tire & Rubber Co., manufacturer of the Holyoke tire. He is also general sales manager. Mr. Laporte was formerly of the Dunbar-Laporte Motor Co. of Holyoke.

Legg Manages Korite Sales

A. D. Legg, branch manager of the New England States for the McQuay-Norris Manufacturing Co., has resigned to accept the position of manager of sales of Korite Products, Inc., of Cambridge, Mass.

Spohn Gardner Agency Executive

Howard L. Spohn has been elected vice-president of the Gardner Advertising Co. and will be the directing head of the Chicago office of the company, which also has offices in New York and St. Louis. In making the change, Mr. Spohn takes with him the accounts he has represented in the past.

Rice Returns From Tour of Southwestern States

DETROIT, March 20—Following a trip through several southwestern States, H. H. Rice, president and general manager of the Cadillac Motor Car Co., reports the outlook bright for steady, conservative prosperity, and an absence of either inflation or deflation.

The States visited were Missouri, Kansas and Oklahoma. Mr. Rice said he was much impressed by substantial developments going on and he noted signs of returning prosperity in the oil regions. No over-extension of credit was visible, he said.

Willys-Overland Reports Greater Output Per Man

TOLEDO, March 18—Demonstration of a big increase in plant efficiency is shown in the fact that with a force of 10,000 men the Willys-Overland Co. last month produced 21,000 cars, equal to 2.1 cars a man, whereas a year ago it required 7500 workmen to turn out 11,000 cars, or 1.47 cars per man.

The company yesterday increased its daily production rate from 1100 to 1200 cars and expects to manufacture close to 25,000 this month, nearly 30 per cent of which are Willys-Knights.

Wants Chassis Taxed, Not Complete Truck

N. A. C. C. Legal Counsel Suggests Clarifying Amendment to Revenue Bill

(*Continued from page* 684)

difficulties in determining, and so will the Revenue Bureau, whether the ultimate consumer will mount it on a taxable or tax-free chassis. The manufacturer, it is pointed out, in many cases will not be able to determine the question himself.

A way of avoiding this difficulty N. A. C. C. officials believe, is to make the truck tax what it was believed Congress intended it to be, a manufacturer's tax, thus relieving the dealer of a great deal of worry.

Regarded as Simplest Remedy

The simplest way, it is suggested, of avoiding all the difficulties, is to credit on the chassis tax whatever exemption Congress sees fit to make, such as to the first thousand dollars of selling price, and to do the same with commercial bodies, and then not to tax the completed vehicle.

Thus Congress would get the desired revenue, the Revenue Bureau would have to deal only with the larger units, such as the car manufacturer and the body-maker, and would not be required to have dealings with all the 45,000 automobile dealers in the United States.

"The Chamber feels that all truck taxes should be established," Alfred Reeves, general manager of the N. A. C. C., says, "but if that is not possible the tax should be levied on the truck chassis instead of the complete truck, with an exemption of so many dollars on the selling price thereof.

"A specific provision should be made for taxing the bodies for such chassis, with a corresponding exemption on the first so many dollars selling price thereof. This will make a more administrable law, will eliminate thousands of small dealers around the country from the detail of the law, and will relieve the sales resistance and discrimination of the present House amendment."

Reeves Optimistic

The favorable action by the Senate on the automobile tax question is regarded as extremely favorable by Mr. Reeves, who is in Washington this week in connection with this and other matters.

"We feel confident that the Senate is entirely sympathetic in the matter and do not anticipate any hitch in the Senate Finance Committee's report to the Senate," Mr. Reeves states.

Truck and Bus Code Undergoes Revision

Change Made by Motor Vehicle Conference Committee Safeguards State

NEW YORK, March 19—Two important changes have been made in the code of "Sound and Equitable Principles for Intra-State Regulation," pertaining to the operation of trucks and buses as common carriers, of the Motor Vehicle Conference Committee.

The revised code is found in the 1924 edition of the committee's booklet on "Governmental Regulation of Motor Vehicle Common Carriers," issued this week. This code is the committee's idea of a model law.

The first change in the principles for which the committee stands has to do with the granting of certificates for the operation of trucks and buses as common carriers. Whereas it formerly read that if the owner of a bus or truck line operated prior to the time when a law assuming State control of motor vehicles as common carriers went into effect it was compulsory to grant a permit or license for such operation regardless of his responsibility.

Responsibility Must Be Proved

The change made, however, safeguards a State in that if the committee's principles are incorporated into the law an operator can be called upon to prove that he is a bona fide operator and responsible and that his route is a necessity, even though he may have been operating prior to the legislative deadline.

The other change has to do with taxation. Instead of making it possible to impose two taxes, one for a motor vehicle and the other for a common carrier, the new paragraph holds that in the event a common carrier is charged a franchise tax that the amount of the motor vehicle tax should be deducted from the franchise tax.

If a high franchise tax is charged it should be in lieu of all other State taxes against motor vehicles, it is held, even including registration unless the latter is merely nominal as in the case of California, where the charge for registration is $3 and common carriers are taxed 4 per cent on gross earnings. The committee also believes that any tax should not be more than is necessary to maintain the properly located and improved highways of the State.

More States Assume Control

The committee also announces that during 1923 six more States passed laws making trucks and buses common carriers and assuming jurisdiction over their operations. These States are Iowa, Michigan, Montana, Oklahoma, South Dakota and Virginia.

This makes thirty-one States in all to take this action, the others being Alabama, Arizona, California, Colorado, Connecticut, Illinois, Maine, Maryland, Massachusetts, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, Utah, Washington, West Virginia and Wisconsin. Georgia and Tennessee also are in the list but as yet they have not exercised their rights as to such jurisdiction.

4171 New Cars Registered in New York Last Month

NEW YORK, March 18—Registrations of new cars of all classes increased in the metropolitan district during February, according to the monthly sales analysis of Sherlock & Arnold. Comparison of January and February of this year with the same months of 1923 and 1922 follows:

	High Priced	Medium and Low Priced	Total
	1924		
January	292	3548	3840
February	357	3814	4171
	1923		
January	212	2803	3005
February	606	2775	3381
	1922		
January	283	2014	2297
February	273	2230	2503

The report shows that in the low and medium priced field five makes were in the lead for the first two months of this year, with registrations in excess of 600. Four others were above 200 and seven others greater than 100. In the higher priced field the list was led by two makes with registrations in excess of 150.

Willys-Overland Lowers Champion Price to $655

TOLEDO, March 17—Willys-Overland Co. announces a reduction in price of the Overland Champion model from $695 to $655.

The price of the Willys-Knight sedan has dropped from $1,795 to $1,695 and that of the Willys-Knight phaeton has been advanced from $1,175 to $1,195. Prices of other models of both the Overland and Willys-Knight lines remain as before.

Marmon's Open Models $110 Higher in Price

INDIANAPOLIS, March 15—Effective March 10, the Nordyke & Marmon Co. has announced an increase of $110 on all open models of Marmon cars. The old and new prices are as follows:

	Old Price	New Price
2 Pass. speedster	$2,985	$3,095
4 Pass. speedster	2,985	3,095
4 Pass. phaeton	2,785	2,895
7 Pass. phaeton	2,785	2,895

RUDOLPH A. LOW DEAD

NEW YORK, March 20—Rudolph A. Low, who retired several years ago as president of the United States Rubber Reclaiming Co., died in Paris, France, Tuesday, where he had been recuperating from a cardiac affliction since last July.

Hoover Would Meet Foreign Monopolies

Asks That Webb-Pomerene Act Be Extended as a Counteracting Influence

WASHINGTON, March 18—A recommendation that the Webb-Pomerene act be extended to permit consumers in this country to set up common purchasing agencies for imported raw materials where there is a foreign combination in control has been made to Congress by Secretary of Commerce Hoover.

In his recommendation, one of the commodities named as being controlled by a foreign monopoly is rubber, which the Department's investigation shows is controlled partly by legislation of the British Government and partly by voluntary combination of producers in the British and Dutch colonies.

The last Congress made a special appropriation to the Department of Commerce to provide for investigation of imported raw materials essential to American industry which are under control of foreign combinations in restraint of price or distribution.

All the reports have not been completed, but Secretary Hoover in a letter to Senator Arthur Capper declares there are abundant data to prove that foreign monopolies or combinations are, potentially or actually, as in the case of the British rubber monopoly.

Hoover Speaks of Possibilities

In commenting on the possibilities under the Webb-Pomerene act, Secretary Hoover said:

It is our conclusion that some relief can be reached legislatively. Our exporters and manufacturers are permitted under the act to undertake joint selling agencies abroad under certain restrictions. If by an extension of this act our consumers were allowed to set up some common purchasing agencies for these imported raw materials where there is positive combination in control I am confident our people could hold their own with such combinations.

The danger of such common purchasing agencies attempting to make improper prices against our buying public could be met by provision in the act to include proper assurance that all consumers who wished to participate would be allowed to act through such common buying agencies with full equality of treatment; that such agencies would not be conducted for profit in themselves, and other necessary restrictions.

Shop Equipment Makers Taking Space at Show

NEW YORK, March 19—More than half the available space at the National Automotive Service convention and Automotive Maintenance Equipment Show has been spoken for by manufacturers of shop equipment and tools. This event, to be held in Detroit, May 19 to 23, is under the auspices of the National Automobile Chamber of Commerce.

One Roof May Cover Entire Chicago Show

Plans Proposed to Enlarge Coliseum and Thus Make Armory Unnecessary

NEW YORK, March 17—A proposed addition to the Coliseum will make it possible to house the next Chicago national automobile show in one building and do away with the necessity of using the First Regiment Armory to care for the overflow, as has been the custom for years.

S. A. Miles, general manager of shows for the National Automobile Chamber of Commerce, has been advised of this prospect by the owners of the Coliseum, who state that if the deal now pending goes through, and they think it will, it will be possible to have the enlarged building ready for use next January, when the next N. A. C. C. show is scheduled to be held.

Land Available for Addition

The proposed enlargement is made possible through the availability of the big tract, 75 x 160, to the north of the present Coliseum, caused by the fire which partially demolished the old Grace Episcopal Church, which has been located there for years. It is proposed to build the Coliseum addition on this land, putting up a three-story building, which will be made a part of the present Coliseum by huge archways on the first floor and from the gallery.

Mr. Miles is not planning to use the third floor of the new building, for the other two floors will give him 25,000 square feet of space, which is about the same area as is available in the Armory. If the demand for space is excessive, it would still be possible to use the Armory, but that is something the management would like to get away from because of the necessity of having to use the alley to get to and from the Armory from the Coliseum.

Would Eliminate Armory

While it has been suggested that the Armory might be retained and used as in the past, enlarging the spaces of those exhibitors fortunate to gain a footing in the Coliseum, there seems to be a disposition on the part of the large manufacturers to avoid this, believing, as they do, that they might be accused of "hogging" the Coliseum and sending others into the Armory, whereas they feel that, if it is possible to put the whole show under one roof, this should be done.

A check-up on the attendance at the recent shows in New York and Chicago proves their strength with the dealers, for New York attracted 11,000 dealers and Chicago 9000, Mr. Miles states. Chicago, despite being 2000 behind New York in the count, was thoroughly representative of the industry as a whole, for all but four States were represented among the retailers who attended the Chicago affair.

Mr. Miles, who is managing the service equipment show which is to be held in Detroit in May, has that affair so well in hand that he is planning to make his annual visit to England, leaving the first week in April in order to be present at the Easter meeting of the English athletic club, of which he has been president for years.

New Mitchell Company Plans Still Indefinite

RACINE, WIS., March 17—The Mitchell Motor Car Co., a new corporation which has taken over patents, designs, parts and service rights and considerable material of the bankrupt Mitchell Motors Co., Inc., on March 15, opened for business in a large shop building on Lake Avenue, near Fourth Street, vacating the former Mitchell plant at Racine Junction, which has been acquired by the Nash Motors Co., Kenosha, Wis.

The new Mitchell company for the present is engaged merely in providing service and replacement parts to Mitchell owners, but its purchase from the trustee in bankruptcy included a round lot of production equipment. While it has been reported that the F-50 Mitchell passenger car would be placed in production by the new concern, present plans do not go beyond the scope of assembling about 500 cars from the large stock of parts and materials left on hand when the old company was forced into bankruptcy.

Definite policies and the scale of new car production will be formulated within a short time, according to W. L. Clunie, in charge of the new factory as service manager.

Electric Truck Makers to Exhibit in New York

NEW YORK, March 17—Twenty-four exhibitors of electric trucks, batteries and accessories will be represented during New York's Electric Truck Week, which opens Saturday, April 19. The show will be held in the showrooms of the New York Edison Co.

Reports received state that February was one of the best months in the history of the electric truck in this city, orders for ninety-six trucks from thirty-one companies having been received. In comparison with 1923, sales to date this year are reported 40 per cent in advance of last year.

FISHER OPERATES NEW PLANT

DETROIT, March 15—The Fisher Body Corp. has started operations in the new plant at the Olds Motor Works, Lansing. Production plans call for 250 closed bodies daily. A. J. Brandt is manager of the division, coming from the Janesville Fisher plant. Frank Wilson, superintendent of finishing and painting at the Olds factory, will supervise the same work in the Fisher plant.

Trucks Sell Briskly in Parts of Indiana

Trade in Indianapolis Sees Year as Producing More Business Than Did 1923

INDIANAPOLIS, March 19—Truck dealers, distributors and factory branches that play an important part in truck distribution in central Indiana report brisk business during the first two months of the year, with good prospects for a much better year than was 1923.

As practically all the larger sized trucks purchased in central Indiana are sold from Indianapolis, the conditions reported by local concerns very clearly reflect the entire truck sales condition throughout Indiana, with the exception of the northern tier of counties and a part of the southern tip of the State.

With a larger road program planned by the State highway commission this year, there has been a considerable business in trucks used for highway building. Several large power plants and other larger construction enterprises in various parts of the State have also made new markets for trucks.

The bus business, which is expanding rapidly, is bringing out a better quality and higher priced type of vehicles. The Indianapolis bus group has several new buses of the most luxurious type on trial, and others are expected, while several six-cylinder jobs are in process of being equipped with bodies and will be put into early use.

Expansion of city building campaigns has forced the opening of new gravel pits at a distance from the city with, in almost every case, motor transport as the basis of transportation. Already five of the larger truck dealers and branches have moved into larger quarters in the last few months, and others are reported looking for more extensive service and sales accommodations.

Day Predicts This Year Will Be Best for Trucks

DETROIT, March 17—Indications in the truck field are for the best year that branch of the industry has known, declares Vance H. Day, general sales manager of General Motors Truck Corp. As reason for this he points out improved business conditions generally, greater use of motor trucks in all lines of industry and the elimination of discarded war equipment from competition.

A new factory branch has been opened in Cleveland to take care of increased business in that territory. O. W. Crawshaw, district sales manager, is in charge. In the first two months of the year the factory reports that sales throughout the country were 21 per cent greater than last year. Unfilled orders on hand are the largest for the season the company has ever had.

Drought Will Affect South African Sales

Farmer Buying Will Be Less Than If Season Had Been Normal —New Cars Arriving

JOHANNESBURG, SOUTH AFRICA, Feb. 20 (*by mail*)—The motor industry throughout South Africa is much interested in the fact that the British Imperial Oil Co.'s new bulk fuel installation is in operation. Three of the largest oil tanks in the British Empire have been built on reclaimed ground at Durban, each of these holding 1,250,000 gallons.

There is a tin and box-making factory here as well and, in all, the installation covers twelve acres of ground. At Johannesburg three tanks with a capacity of 50,000 gallons of gasoline each have been erected, together with a filling depot for distributing the gasoline throughout the Transvaal.

Fuel Reduced in Price

The South African Railways have put six petrol tank trucks, each with a capacity of 5000 gallons, into operation, and the fuel is brought straight from the main tanks at Durban to the Johannesburg installation. The first effect of this installation has been to reduce the price of petrol, which, under the two gallon can system as used in England, can be sold at the coast at 50 cents a gallon and in Johannesburg at about 8 cents more. Fifty cent petrol has long been looked forward to in South Africa, and the industry thinks that cheaper fuel will make a very great difference to business during 1924—good as it was in 1923.

The severe drought in South Africa, which has just been broken, has crippled the farming industry, and there will not be as many cars purchased in the country districts as would have been the case had there been a normal season. Very few farmers will obtain good crops, and government help is being asked for in some districts where the distress is very real. The drought has also played havoc with the roads—such as they are—for these have become pulverized.

New British Models Arrive

The British car manufacturers are concentrating more intensively than ever upon the colonial markets, and new models continue to arrive in South Africa. The Morris-Cowley and Morris Oxford cars are the latest arrivals, and they have met with an excellent reception. They are well-finished jobs that sell at a competitive price and look as if they will stand up to work on country roads. A good sale for them in the cities, at all events, is forecast.

There is little evidence that the very small cars will become popular in South Africa, however, for road conditions demand more power than 7 or 8 hp. But in the towns there is a tendency on the part of motorcyclists to try these small and well-finished English cars. Citroen has sent his latest models to this country, and although the small one is only rated at just over 7 hp., it might become popular because of the extremely low price.

Ford's new assembly plant at Port Elizabeth is now in production, and it is announced that cars for the whole of Africa at the rate of about 300 a month can be turned out. Provision has been made for increased production, if necessary. The prices of Ford cars have been reduced lately, and this popular make is selling very well.

Ford Demands Good Service

The Ford company is appointing agents direct and is demanding that efficient service be given. A model service station has been instituted at the Port Elizabeth factory, and agents in all parts of the country are invited to send their service men to it for tuition. This invitation has met with a ready response.

The question of a body building industry under government protection has again cropped up, but nothing is likely to happen in 1924. Australia has been held up as the example, for there very large body building works have come into force.

It is thought that a large body-building industry in South Africa would be most desirable, although it is admitted that at present no firms are equipped to tackle the proposition in a large way, although bodies are built for practically all the buses and commercial vehicles.

Wright Reports Earnings of $1.31 Share Last Year

NEW YORK, March 17—Most of the business of the Wright Aeronautical Corp. and the Wright Flying Co. in 1923 was in the manufacture of engines and parts, the annual report showing that of $2,226,891 net sales, $1,860,512 was for engines and parts built. Most of this was for military requirements.

The financial report shows net income of $326,582, after taxes and charges, which is equivalent to $1.31 a share earned on the 249,390 shares of no par common, which compares with $523,431 in 1922. Current assets were $2,281,967, against current liabilities of $142,643. Current assets included cash of $388,358, marketable securities valued at $870,565 and inventories valued at $706,720.

President F. B. Rentschler states that during the year the plant account was increased approximately $90,000 to provide special tools and equipment to manufacture air-cooled engines, which became a part of the business through the purchase last May of the Lawrance Aero Engine Corp.

It is stated that the Wright corporation already has received new business totaling over $400,000 for the Lawrance type of air-cooled engine, while at the end of the year the corporation had $2,094,135 in orders on its books, while since then this has been increased by $237,984.

Splitdorf President, John F. Alvord, Dies

Also Headed Other Companies, but Was Gradually Retiring from Active Business

NEW YORK, March 17—John F. Alvord, long a prominent factor in the parts and accessory manufacturing side of the automobile industry, died suddenly last Thursday night at his New York residence of a cerebral hemorrhage.

After a most successful business career, Mr. Alvord was gradually retiring from active business life at the time of his death. He still was president of the Splitdorf Electric Co. of Newark, N. J., and head of the Torrington Co. of Torrington, Conn., and the Progressive Manufacturing Co. He also held a directorship in the Wire Wheel Corp. of America, but had shifted some of his other executive burdens.

Mr. Alvord at one time was president of the Hendee company, manufacturing the Indian motorcycle. He became even more actively identified with the automobile industry when he and his associates took over C. F. Splitdorf, Inc., in 1912 and formed the Splitdorf Electric Co., of which he had been president ever since. Successful in this, he formed the Wire Wheel Corp. of America about nine years ago, taking over the interests of George W. Houk & Co. He retired from this presidency several months ago, although retaining his place on the board of directors.

During the war Mr. Alvord was president of the Wright-Martin Aircraft Corp., and at one time was a director of the Pierce-Arrow Motor Car Co.

Mr. Alvord was born in Torrington May 9, 1861, the son of Charles Alvord, founder of the Excelsior Needle Co., which later became the Torrington Co. John F. Alvord joined his father in business in the early eighties and met with success in all of the varied enterprises in which he was interested.

John M. Mack Is Killed; Was Early Truck Maker

ALLENTOWN, PA., March 17—John M. Mack, founder of the Mack Brothers Motor Car Co. of Brooklyn, and a pioneer motor truck builder, met a sudden death last Friday when his automobile was struck by a work car of the Lehigh Valley Transit Co. near Neffs, twelve miles from this city.

Mr. Mack founded the Mack Brothers Motor Car Co. prior to 1900 and made wagons and trucks. He developed the Mack truck and in 1912 sold his interests to the International Motor Co. He remained with that concern for some time, later going to Scranton, Pa., where he formed a company to build the Maccar truck. Of late years he had been a retailer of Republic trucks in Allentown.

European Race Cars to Use Supercharger

It Is Likely All Will Carry Them —Fiat Gets 150 H.P. from 122 Cu. In. Engine

PARIS, March 8 (*by mail*)—Fiat has succeeded in obtaining 150 hp. out of the new 122 cu. in. racing engines built for the European Grand Prix, to be run at Lyons Aug. 3. Although details are being kept secret, it is understood that the new racing engines are two-stroke six-cylinder V-type, fitted with a supercharger.

The first of the cars has been tried out on Monza track, near Milan, in competition with one of last year's eight-cylinder four-stroke engines, Bordino driving last year's car and Salamano handling the new car. The latter was declared to be 15 miles an hour faster than the 1923 racer.

Indications are that superchargers will be found on all this year's racing mounts. Sunbeam is rebuilding last year's cars by adding a supercharger to the engine, putting the change speed lever in the center, fitting a new rear axle and steering gear, and better streamlining, particularly underneath.

Delage will race with a twelve-cylinder V-type engine, on the same lines as the one used last year, with roller bearings throughout, and with a supercharger added. The blower is brought into operation by means of a clutch whenever extra power is required.

Bugatti Has Straight Eight

Bugatti will race with the same general type of straight eight as last year, and probably will use a supercharger. The beetle back type of body is being discarded in favor of more normal streamlining. Four gears will be fitted in place of three. Alfa-Romeo will race with a straight six two camshaft engine. The two Schmid cars, built by the S.R.O. Ball Bearing Co. have six cylinder engines with a cuff valve, built to patents held by M. Schmid. Supercharger experiments are being carried out.

The only American car in this race is the straight eight Miller owned by Count Zborowski, who, in preparing it for the Grand Prix, will add a fourth gear and may possibly use a supercharger. Total number of starters will be twenty-two, representing France, England, Italy and America.

OLDS SALES IN 1923

NEY YORK, March 17—Approximately 35,000 cars of a retail value of $38,000,000 were sold by the Olds Motor Works in 1923, according to an announcement made by the General Motors Corp. It is estimated that 7792 freight cars were required to move the finished product from the factory to points of destination, despite driveaways and boat shipments. Raw material and semi-finished products coming to the factory required another 3979 freight cars, while the company's freight bills for incoming material alone amounted to about $428,000.

FINANCIAL NOTES

Westinghouse Electric & Manufacturing Co. directors have approved an offering to stockholders of record on March 17 of $17,955,000 par value additional common stock at $52.50 a share payable April 16. The board also declared a stock dividend of 10 per cent payable in common stock to stockholders of record May 2, 1924. The new stock offered for subscription will thus share in the stock dividend.

Pyrene Manufacturing Co. reports profits of $209,572 in 1923 after reserve for depreciation but before allowing for Federal taxes, against $123,224 in 1922. Dividends amounting to $146,316 were paid last year, leaving a surplus of $63,256, compared with a deficit of $23,092 reported in 1922 after dividends.

Pines Winterfront Co., manufacturer of Pines radiator shutters, has been listed at the Chicago stock exchange for trading. The company listed 50,000 shares of Class A stock with a par value of $5. This stock was brought out by a syndicate a few days ago and quickly oversubscribed.

Detroit Motor Bus Co. will issue $500,000 additional capital stock and pay a stock dividend of $250,000. This is to be used for expansion purposes.

Peerless Truck & Motor Corp. has declared a dividend of 50 cents on the common, payable March 31 to stock of record March 20.

Brake Tests Conducted in Milwaukee by S. A. E.

MILWAUKEE, March 15—A joint meeting of Chicago and local members of the Society of Automotive Engineers was held here yesterday for the purpose of making comparative tests between cars equipped with brakes of various kinds. Stopping distances were measured by tape and by the Bureau of Standards decelerometer.

Following the tests in the afternoon a dinner was held at the Milwaukee Athletic Club incident to which talks were made by A. Y. Dodge, chief engineer of the Perrot Brake Corp. and W. S. James of the Bureau of Standards.

Mr. Dodge explained features of the Perrot brake while Mr. James gave an outline of investigations made by the Bureau to determine fundamentals on which any brake operation depends.

S. A. E. New England Meeting

BOSTON, March 17—Motor car headlights, their use and abuse, provided the principal topic of discussion at a meeting of the New England Section of the Society of Automotive Engineers. Findings of the Bureau of Standards were presented by R. E. Carlson. The talk was similar to that given at the meeting of the factory service managers and S. A. E. at Dayton last fall. The meeting was preceded by a dinner at the Engineers' Club.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

Business developments last week were of the irregular and conflicting nature which has been characteristic of the past month. Stock prices, after showing firmness throughout the week, reacted suddenly on Monday. The grains slumped rather heavily, while raw cotton showed some slight improvement. Commodity prices in general moved somewhat lower.

The general industrial advance in February was reflected in reports from the Department of Labor, showing an increase in employment of 1.2 per cent for the month. This was the first general increase recorded since last June, and was accompanied by a gain of 6.7 per cent in payrolls and 5.4 per cent in per capital earnings in the 8222 establishments covered.

Building permits reported to Bradstreet's for February totaled $263,361,229, as against $211,937,777 in the preceding month. The largest increases occurred in the Middle Atlantic and Central Western States, while the Southwestern States showed a decline, and the Southern section was practically unchanged.

Less Cotton Consumption

Consumption of cotton by American mills in February amounted to 507,867 bales, as compared with 576,644 bales in January and 566,895 bales in February a year ago. February exports totaled 482,146 bales, against 546,253 in the preceding month and 359,657 in the same period last year.

Fisher's index of wholesale commodity prices stood at 150.7 last week, comparing with 151.7 for the preceding week and 166 for the corresponding period a year ago. Last week's figure marks the fifth successive decline from the year's high mark of 155.2, reached in the week of Feb. 9.

Discounts by Federal Reserve banks declined $4,900,000 during the week ended March 12, an increase of $2,600,000 in bills secured by Government obligations, being over-balanced by a decrease of $7,500,000 in "other bills discounted."

Bank Loans Increased

Loans of reporting member banks increased $57,000,000 during the week ended March 5. While loans secured by Government obligations declined $14,000,000, loans secured by stocks and bonds increased $15,000,000 and "all other" loans $56,000,000. Investments declined $48,000,000, and borrowings from Federal Reserve banks $35,000,000, while net demand deposits increased $7,000,000 and time deposits $10,000,000.

Both call and time money was easy and in light demand last week. Call loans ranged from 4 to 4¼ per cent and fell to 3½ per cent on Monday of this week. Time loans ranged from 4½ to 4¾ per cent.

Finland Lowers Duty on Cars and Wheels

Other Foreign Countries Change Their Schedules or Alter Regulations

WASHINGTON, March 18—According to advices to the Automotive Division of the Bureau of Foreign and Domestic Commerce, several foreign countries have made changes in their tariff regulations.

A material downward revision in the import duties of automobiles and automobile wheels imported into Finland has been made. The new duty, effective at once, on automobiles has been reduced from 40 per cent ad valorem to 20 per cent, and on wheels for automobiles and trucks from 40 per cent ad valorem to 5 per cent. The duty of 10 per cent ad valorem on trucks and commercial vehicles remains the same as the present rate —10 per cent ad valorem.

Polish Tariff Changed

The duty on complete passenger cars imported into Poland must be paid in actual gold coin, but the Ministry of Commerce and Industry has ruled that on commercial cars and chassis without bodies, the duty may be paid in Polish marks at the gold rate of the day.

The Polish automobile dealers and importers have registered a strong protest against the provision for payment of import duties on automobiles in gold, claiming that it is difficult for them to find gold coin for the payment, and are still pressing for a relaxation of this requirement.

The new duties into Poland are as follows:

Upholstered passenger cars, 111 Zloly (or franc, normally equivalent to $.193) each 100 kilos, plus 20 per cent ad valorem; passenger cars, not upholstered, 111 Zloly each 100 kilos; trucks, 74 Zloly each 100 kilos; parts for passenger cars or trucks, 49.50 Zloly each 100 kilos; chassis, with differential transmission, 111 Zloly, less 25 per cent ad valorem each 100 kilos, and chassis, with chain transmission, 74 Zloly each 100 kilos, less 90 per cent ad valorem.

New Rates to Guatemala

Effective April 1, the duty on passenger cars imported into Guatemala will be increased 50 per cent over the present tariff duties, and the duty on trucks will be reduced 25 per cent. The present duty on passenger cars and trucks is 0.20 peso a gross kilo, the present rate of exchange on the peso being computed at $.018

Colombia Announces Changes

Effective March 29, fifteen days are allowed after the receipt of notice of the arrival of the goods at a Colombian customhouse for the removal of the goods and the payment of duties and surtaxes. After the expiration of that period, a fine of $.50 each package will be levied for each day the goods remain in the customhouse. If the goods have not been removed and the duties and surtaxes paid within sixty days after the expiration of the fifteen days allowed, the goods will be sold at public auction at the end of 120 days and the proceeds applied to cover duties, surtaxes and other charges, the balance to be turned over to the importer provided no other claimant who has a better right appears.

American exporters are being asked to watch their shipments to Colombia, as the order was promulgated as a result of the congestion of American goods coming into the port.

INDUSTRIAL NOTES

Perfection Gear Co. of Chicago, which is exclusively licensed to manufacture gears from formica, is now in production on a complete line of steel differential drive gears and pinions in addition to its line of formica timing gears. This company reports a rapid increase this year in its replacement gear business.

Jas. F. Miller & Hurst Corp., Detroit, has been retained by G. M. Haardt, director general of the André Citroen Motor Works, as consultants and advisors on the building and equipping of the new foundry that will be erected in the suburbs of Paris. The Miller-Hurst organization has recently completed extensive foundry projects in this district and are now working on similar developments in Ohio and Pennsylvania. The organization is credited with the designing, erection and equipment of the Ford River Rouge foundries.

Stout Metal Airplane Co., has opened offices in the General Motors Building, Detroit, the company removing them from the former location at the plant.

Anderson Motor Co. of Rock Hill, S. C., will rebuild at once the woodworking department of its plant recently destroyed by fire at a loss of about $35,000 to $40,000. The plant will be newly equipped throughout, the company announces.

The Prime Manufacturing Co., Milwaukee, specializing in the production of brass and bronze castings for the automotive industries and railroads, is starting work on a new brass foundry, 80 x 160 ft., two and three stories high, which will enable it to treble its capacity by July 1.

Mullins Body & Tank Co., Milwaukee, manufacturing dump bodies for motor trucks, is extending its facilities to a considerable extent. Electrically welded compartment tanks for motor trucks, and underground tanks for oil and gasoline storage are now being made on a commercial scale, and the Wood-Detroit hydraulic hoist is being distributed in this territory, being incorporated also in Mullins dump body design.

Chassis Brace Co., Mobile, Ala., which manufactures the Scholtes Chassis Brace for Ford cars, has moved to larger quarters at 705 Dauphin Street, and is otherwise enlarging its manufacture and sales facilities.

CONDITIONS IN PHILADELPHIA

PHILADELPHIA, March 15 — The truck business is running somewhat below normal. Sales of passenger cars are hardly up to the mark set last year, although well above the average of the last two or three years.

METAL MARKETS

Automotive consumers are not contracting for their second quarter sheet requirements as readily and rapidly as rollers had expected. With the exception of a few large users of full-finished sheets who have covered their second quarter wants at what was said in at least one case to have been a specially attractive price, buyers are disposed to make many bites of one cherry and are apparently satisfied to place their orders not more than a few weeks ahead of when their operating schedules call for it. So few cases of delays in the transportation of material from steel mills to their plants have been experienced of late by consumers that they have become spoiled.

For all that, more and more sheet buying is coming out from day to day on the "many mickles make a muckle" order, and most of the mills specializing in full-finished automobile sheets have little cause to worry about their backlog of orders. The fresh demand, however, decidedly lacks snap. Wall Street continually points to the excellent rate of steel production as one of the constructive factors in the business situation when it is this very excellent rate of production that is the cause of considerable anxiety in the steel market. Will the demand quicken sufficiently to absorb production at a one-third higher rate than in December? That is the question asked in the steel market.

Some go so far as to say that right now considerable of the output is being stocked. Statisticians have become so accustomed to look upon figures of steel production as interchangeable with the missing figures of steel consumption that they fail to see the possibility of output figures showing overproduction, a condition that many steel market observers assert has actually set in. There are those who predict that the downward turn will come in April which last year was the high production month. This together with increasing reports of price concessions in the market for black and blue annealed sheets makes for a natural hesitancy on the part of buyers.

It is certain that during the first half of March it was a case of nip and tuck between sheet orders and shipments, and yet sheet mills were making as much effort to speed up production as though orders ran way ahead of shipments. The explanation for this, of course, is that the orders in hand called for prompt shipment. Much of the activity in the Mahoning, Monongahela and Shenango Valley mills must be ascribed to the fact that the steel industry is living to some extent on hopes. The smaller independents are out gunning for all business in sight, and there is a feeling that this energy will be rewarded with sufficient business to warrant maintenance of the prevailing rate of operations.

Pig Iron.—Intensive quiet characterizes the market for foundry and malleable irons, automotive foundries confining their buying to retail tonnages.

Aluminum. — The domestic producer, usually not very communicative about prices, undoubtedly had special reasons for permitting the news of the recent price advance to filter through. The object ostensibly was the effect on the so-called "outside" market in which holders usually strive to obtain a shade better than the domestic producer's price. At the advance they have not been able to realize this ambition so far.

Copper.—The metal market is marking time.

Calendar

SHOWS

Jan. 3-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory.

Jan. 24-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

FOREIGN SHOWS

April 2-13—Barcelona, Automobile Exposition, under the auspices of the Confederacion de Camaras Sindicales Espanolas del Automovilismo y Ciellismo, Palacio de Arte Moderno.

April 6-April 27—Rosario, Argentina, under the auspices of the Automovil Club Argentino.

April 8-22—Milan, Annual Automobile Show, Sports Palace.

April 16-21—Johannesburg, South Africa, Witwatersrand Motor and Agricultural Show.

May 10-20—Madrid, Annual Automobile Show, under the auspices of the National Association of Automobile Importers, Palacio del Helo y del Automovil.

Aug. 23-Sept. 6—Toronto, Ont., National Automobile Show in conjunction with the Canadian National Exhibition under the sanction of the Canadian Automotive Equipment Association and the Automotive Industries of Canada.

Oct. 2-12—Paris, passenger cars, motor cycles, bicycles and accessories, Grand Palais.

Oct. 17-25—London, Annual Passenger Car Show, Olympia.

Oct. 22-31—Paris, motor trucks, stationary engines, garage tools and machine tools, Grand Palais.

RACES

April 24—Fresno.

April 27—Trapani, Italy, International Automobile Race.

May 30—Indianapolis.

June 14—Altoona.

July 4—Kansas City.

Aug. 3—Lyons, France, European Grand Prix.

Sept. 1—Altoona.

Sept. 1—Syracuse.

Oct. 4—Fresno.

Oct. 19—Kansas City.

Nov. 24—Los Angeles.

CONVENTIONS

March 31-April 4—New Orleans, Annual Spring Meeting of the Automotive Equipment Association.

May 19-22 — Detroit, National Automotive Service Convention and Maintenance Equipment Show, under the auspices of the Service Division of the National Automobile Chamber of Commerce, General Motors Building.

May 21-24—Detroit, International Motor Transport Congress under the auspices of the National Automobile Chamber of Commerce.

June 3-4—Detroit, Midsummer Meeting of the Automobile Body Builders Association, Hotel Statler.

June — Washington, Pan American Highway Congress, under the auspices of the Pan American Highway Mission.

Sept. 22-26—Boston, Sixth Convention and International Steel Exposition of the American Society for Steel Treating.

S. A. E. MEETINGS

April 2—Milwaukee Section, The Future Passenger Car, C. W. Pendock, chief engineer, Le Roi Co.

April 3—Detroit Section, Chassis Lubrication, F. H. Gleason, General Motors Building, Detroit, 8 p. m. Dinner, 6.30 p. m.

April 17—Metropolitan Section, Fleet Maintenance, F. Winchester.

May 15—Metropolitan Section, What Roads and Steels Do to Automobiles.

June 24-27—Summer Meeting of the S. A. E., Spring Lake, N. J.

Oct. 21-24—S. A. E. Production Meeting, Detroit.

Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland.

—Aeronautical Meeting at Dayton at the time of the Pulitzer Races.

January—S. A. E. Annual Meeting, Detroit.

German Speculators Flood French Market

PARIS, March 8 (*by mail*)—German buyers are purchasing all available new and used cars to be found on the French market, and particularly those of medium and low power. Automobile trade with Germany has been growing since last October, but at the beginning of January buying assumed really important proportions, for in addition to established dealers large numbers of speculators swept into France and scoured the country for cars.

The Peugeot Co. has sold 1,500,000 francs worth of used cars and out of date models to German dealers and has refused a contract for 800 cars; the Delage Co. has turned down an order for 200 automobiles; one Voisin salesman has averaged four cars a day to German purchasers during the last two weeks; the Talbot, Hotchkiss, Charron, Mathis, Bugatti, Citroen and Renault companies report big business with Germany, most of this being with established dealers, who in many cases drive the cars away from the factory.

Marks High Buying Power

While the new Rentenmark gives Germans a high purchasing power in France, for it is equivalent at the present time to six francs, nearly all the business has been done with dollars, Swiss francs or sterling as a basis. With the dollar worth 22 francs, French automobiles are cheaper than those of German origin, even with a 40 per cent ad valorem duty added to their purchase price.

Most of the business is being done with the occupied portion of Germany, for restrictions make it difficult to get cars into the non-occupied regions. So long as the buying was confined to established automobile dealers with which the French firms had connection, no objection was raised to it; but since speculators, acting either alone or with the backing of German banks, have come into the movement, French manufacturers have shown a tendency to hedge themselves in, although the financial guarantees offered them were all that could be desired.

This sudden wave of intensive buying on the part of Germany, which, however, is not confined to automobiles, is puzzling the trade. It is interpreted as a sure indication that Germany possesses wealth and, indeed, in most cases the German firms boast of their purchasing power. One concern, writing to the Hotchkiss Co., stated that "possessing superabundant capital it was in the market for automobiles."

The head of one of the leading French automobile companies estimates that 50 per cent of the German purchases are legitimate and are being made by dealers who deliver the cars direct to users, and 50 per cent are of a speculative character made by persons entirely outside the trade who are making use of their foreign currencies at a time when the French franc stands low, or who are seeking to convert their cash into goods in order to avoid a possible levy on capital to meet reparations claims. The demand is too sudden and too big to be considered as entirely healthy.

BUICK SALES LAST YEAR

FLINT, MICH., March 4—The Buick Motor Car Co. sold 218,286 cars in 1923, according to an official announcement made today. This compares with 138,520 in 1922 and 83,888 in 1921.

Detroit Plans Series of Central Garages

DETROIT, March 17—A series of down-town and centrally located garages is being planned for Detroit, the principal object of them being to take parked cars off the streets and relieve traffic congestion. The garages will be built mainly for day-parking, but will be equipped to make minor repairs and to do washing and other light service work. They will also carry lines of accessories.

The company which will own and operate the garages will be known as Detroit Garages, Inc., and is now in formation. Men composing the group which are behind it are among the most prominent in Detroit, and include several well-known figures in the industry. Among these are Roy D. Chapin, chairman of the board of the Hudson Motor Car Co.; Howard E. Coffin, vice-president of Hudson, and John B. Ford, Jr., Sun Oil Co.

Nicol, Ford & Co., investment bankers, have formed and underwritten the $1,000,000 corporation, which upon completion of its organization, will proceed with its plans for operation immediately.

---

45 CLEVELANDS MADE DAILY

CLEVELAND, March 10—J. L. Krall, secretary and treasurer of the Cleveland Automobile Co., announced after the annual meeting of stockholders today that the company is manufacturing from 45 to 50 cars a day. Directors who were re-elected are: F. C. Chandler, Samuel Regar, J. A. Fayne, J. V. Whitbeck and Sid Black. Officers are: J. V. Whitbeck, president; Sid Black, vice-president, and J. L. Krall, secretary and treasurer.